SONY

3-800-475-23 (1)

Video Camera Recorder 8

CCD-TR44/TR54/TR64/TR74/TR84/TR94

Operation Manual

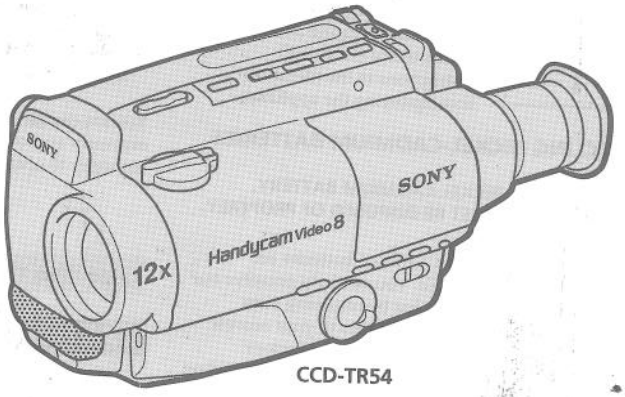
Before operating the unit, please read this manual thoroughly, and retain it for future reference.

Owner's Record

The model and serial numbers are located on the bottom. Record the serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. CCD-_____ Model No. AC-_____

Serial No. _____ Serial No. _____



CCD-TR54

Video8 Handycam

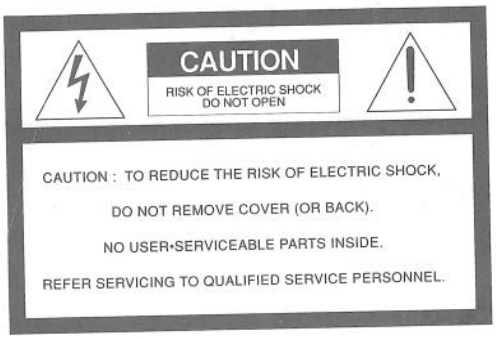
©1995 by Sony Corporation

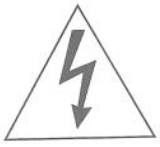
Welcome to video 8

Congratulations on your purchase of this Sony Handycam® camcorder. With your Handycam, you can capture life's precious moments with superior picture and sound quality. Your Handycam is loaded with advanced features, but at the same time it is very easy to use. You will soon be producing home video that you can enjoy for years to come.

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION : TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

RECYCLING NICKEL-CADMIUM BATTERIES

Ni-Cd

NICKEL-CADMIUM BATTERY. MUST BE DISPOSED OF PROPERLY.

Nickel-Cadmium batteries are recyclable. You can help preserve our environment by returning your unwanted batteries to your nearest Sony Service Center or Factory Service Center for collection, recycling or proper disposal.

Note: In some areas the disposal of nickel-cadmium batteries in household or business trash may be prohibited.

For the Sony Service Center nearest you call 1-800-222-SONY (United States only).
For the Factory Service Center nearest you call 416-499-SONY (Canada only).

Caution: Do not handle damaged or leaking nickel-cadmium batteries.

For the Customers in the U.S.A.

WARNING

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

— Reorient or relocate the receiving antenna.
— Increase the separation between the equipment and receiver.
— Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
— Consult the dealer or an experienced radio/TV technician for help.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

For the Customers in CANADA

CAUTION

TO PREVENT ELECTRIC SHOCK, DO NOT USE THIS POLARIZED AC PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

Table of Contents

Before You Begin
Notes and Precautions 4
Checking Supplied Accessories 5
Checking Your Model Number 6

Getting Started
Charging and Installing the Battery Pack 7
Inserting a Cassette 11

Basic Operations
Camera Recording 12
  Using the Zoom Feature 15
Hints for Better Shooting 16
Checking the Recorded Picture 17
Connections for Playback 18
Playing Back a Tape 19

Advanced Operations
Using Alternative Power Sources 21
Recording with the Date or Time 23
Using the PROGRAM AE Function 24
Shooting with Backlighting 25
Shooting Scenery in Several Short Takes 26
Superimposing a Title 27
Using the STEADY SHOT Function (CCD-TR84/TR94 only) 28
Changing the Mode Settings 29
Editing onto Another Tape 30

Additional Information
Changing the Lithium Battery in the Camcorder 31
Resetting the Date and Time 33
Playback Modes 34
Tips for Using the Battery Pack 34
Maintenance Information and Precautions 38
Using Your Camcorder Abroad 42
Trouble Check 43
Specifications 46
Identifying the Parts 48
Warning Indicators 55
Index Back cover

Notes and Precautions

Note on TV Color Systems

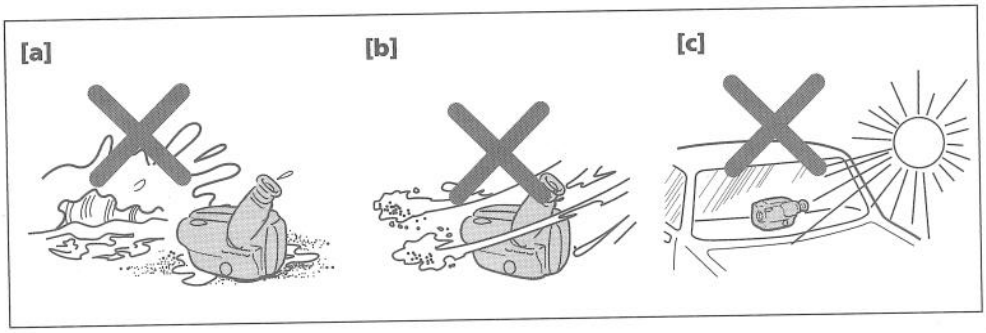
TV color systems are different depending on the countries. If you view the playback picture on a TV, you need an NTSC system based TV. When you want to use a PAL M system based TV, you will need an NTSC/PAL M transcoder (as this is an NTSC system based camcorder). Please check the list on page 42 to see the TV color system of your country.

Precaution on Copyright

Television programs, films, video tapes, and other materials may be copyrighted.
Unauthorized recording of such materials may be contrary to the provision of the copyright laws.

Precautions on Camcorder Care

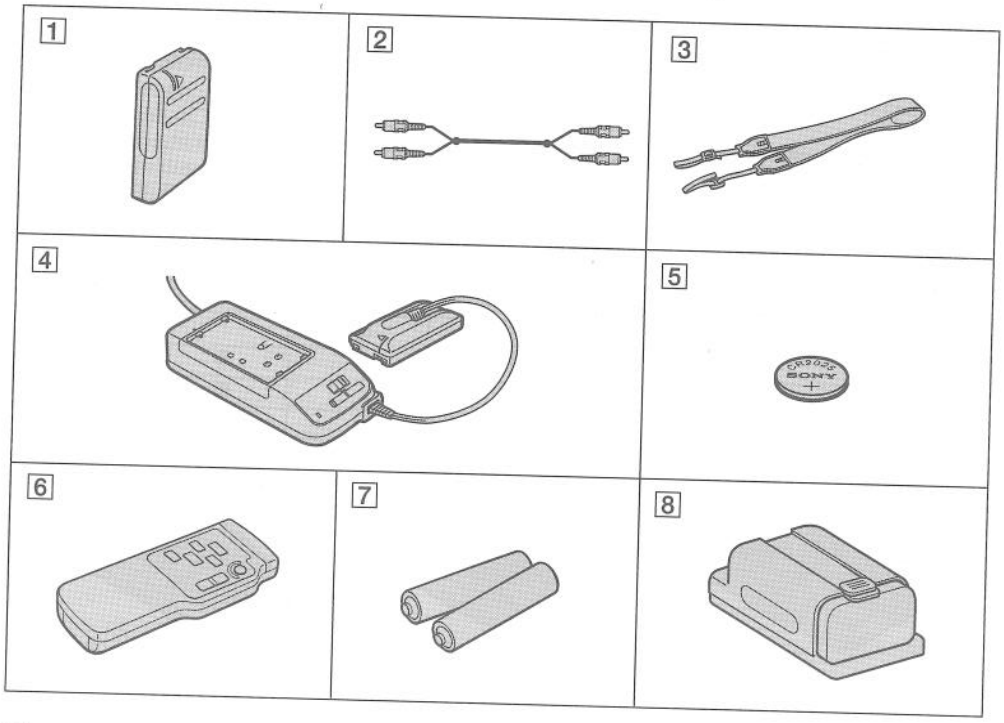
- **Do not let the camcorder get wet. Keep the camcorder from rain or sea water. It may cause a malfunction and sometimes the malfunction cannot be repaired. [a]**
- **Do not let sand get into the camcorder. When you use the camcorder on a sandy beach or dusty place, protect it from the sand or dust. Sand or dust may cause the unit to malfunction and sometimes the malfunction cannot be repaired. [b]**
- Never leave the camcorder under temperatures above 140° F (60 °C), such as in a car parked in the sun or under direct sunlight. **[c]**



See "Precautions" on page 41 as well.

Checking Supplied Accessories

Check that the following accessories are supplied with your camcorder.



1 **NP-33 Battery Pack (1) (p. 7)**

2 **A/V connecting cable (1) (p. 18)**

3 **Shoulder strap (1) (p. 51)**

4 **AC-V15/V16/V16A AC power adaptor (1) (p. 7, 21)**

5 **CR2025 Lithium Battery (1) (p. 31)**
Already installed in the camcorder.

6 **Wireless Remote Commander (1) (p. 19, 51)**
For CCD-TR54/TR64/TR74/TR84/TR94 only

7 **Size AA (R6) battery for Remote Commander (2) (p. 52)**
For CCD-TR54/TR64/TR74/TR84/TR94 only

8 **Battery case (1) (p. 22)**

Checking Your Model Number

The instructions in this manual are for six models listed below. Before you start reading and operating, check your model number by looking at the bottom of your camcorder. The CCD-TR54 is the model used for illustration purposes. Otherwise, the model name is indicated in the illustrations. Any differences in operation are clearly indicated in the text, for example, "For CCD-TR84 only".
As you read through this manual, buttons and settings on the camcorder are shown in capital letters.
e.g. Set the POWER switch to CAMERA.

Types of Differences

Model	Remote Commander	Viewfinder		Zoom			Steady Shot
		Black and white	Color	10x	12 x	12x ↔ 24x	
CCD-TR44		●		●			
CCD-TR54	●	●			●		
CCD-TR64	●		●		●		
CCD-TR74	●		●			●	
CCD-TR84	●	●				●	●
CCD-TR94	●		●			●	●

Contents of the recording cannot be compensated if recording or playback is not made due to a malfunction of the camcorder, video tape, etc.

Charging and Installing the Battery Pack

Before using your camcorder, you first need to charge and install the battery pack. To charge the battery pack, use the supplied AC power adaptor.

Charging the Battery Pack

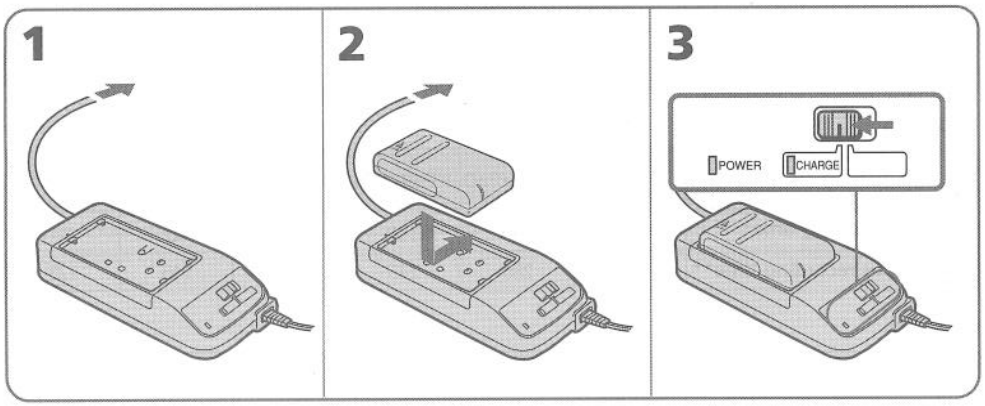
Charge the battery pack on a flat place without vibration.

(1) Connect the AC power adaptor to the wall outlet.

(2) Align the right side of the battery pack with the line on the AC power adaptor, then slide the battery pack in the direction of the arrow.

(3) Set the selector to CHARGE. The CHARGE lamp (orange) lights up. Charging begins.

When charging is completed, the CHARGE lamp goes out. Unplug the unit from the mains, and then remove the battery pack and install it on the camcorder.



Charging Time

Battery pack	NP-33 (supplied)	NP-98/98D	NP-80/80D	NP-68/66H	NP-C65	NP-60D
Charging time*	60	215	190	125	105	90

* Approximate minutes to charge an empty pack using the supplied AC power adaptor (Lower temperatures require a longer charging time.)

Battery Life

CCD-TR44/TR54

Battery pack	NP-33 (supplied)	NP-98/98D	NP-80/80D	NP-68/66H	NP-C65	NP-60D
Typical recording time*	50	175	150	105	85	75
Continuous recording time**	90	305	265	180	155	135

CCD-TR64

Battery pack	NP-33 (supplied)	NP-98/98D	NP-80/80D	NP-68/66H	NP-C65	NP-60D
Typical recording time*	45	170	145	100	85	70
Continuous recording time**	85	300	255	175	155	130

CCD-TR74

Battery pack	NP-33 (supplied)	NP-98/98D	NP-80/80D	NP-68/66H	NP-C65	NP-60D
Typical recording time*	45	160	140	95	80	70
Continuous recording time**	85	280	245	170	145	125

CCD-TR84

Battery pack	NP-33 (supplied)	NP-98/98D	NP-80/80D	NP-68/66H	NP-C65	NP-60D
Typical recording time*	45	155	135	95	80	65
Continuous recording time**	80	275	240	165	145	120

CCD-TR94

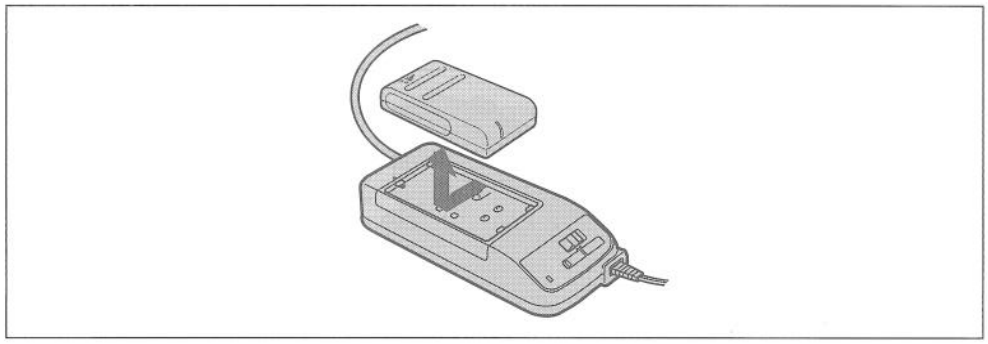
Battery pack	NP-33 (supplied)	NP-98/98D	NP-80/80D	NP-68/66H	NP-C65	NP-60D
Typical recording time*	45	155	130	90	75	65
Continuous recording time**	80	270	230	160	140	115

* Approximate minutes when recording while you repeat recording start/stop, zooming and turning the power on/off. The actual battery life may be shorter.

** Approximate continuous recording time indoors.

Removing the Battery Pack

Slide the battery pack in the direction of the arrow.



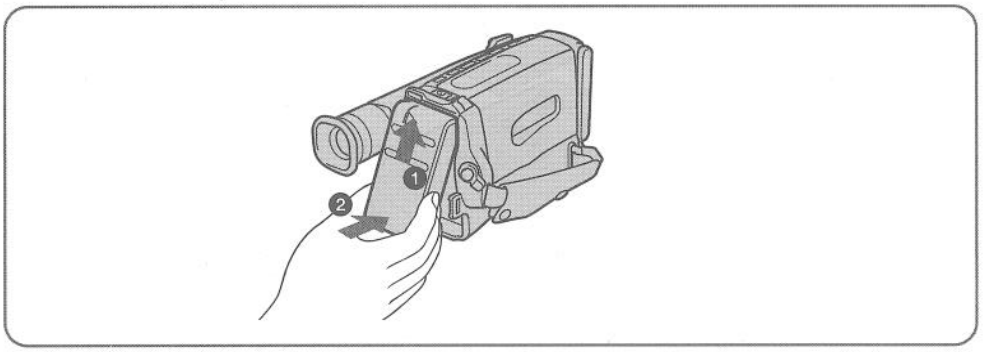
Notes on charging the battery pack

- The POWER lamp will remain lit for a while even if the battery pack is removed and the power cord is unplugged after charging the battery pack. This is normal.
- If the POWER lamp does not light, set the selector to VTR (DC OUT) and disconnect the power cord. After about one minute, reconnect the AC power cord and set the selector to CHARGE again.
- You cannot operate the camcorder using the AC power adaptor while charging the battery pack.

Charging and Installing the Battery Pack

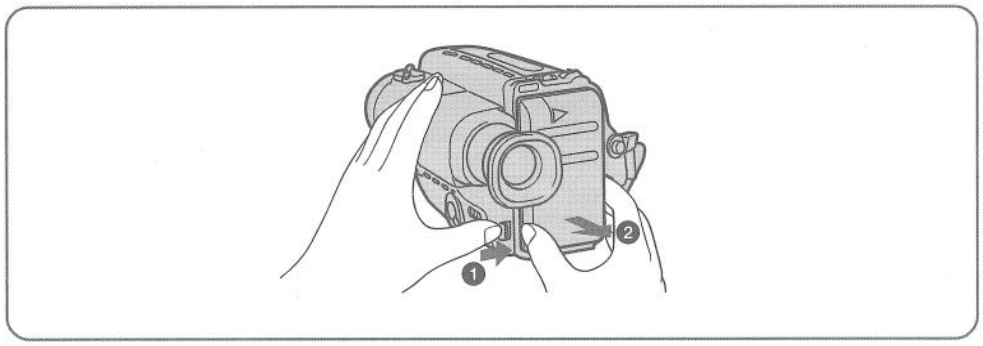
Installing the Battery Pack

(1) Insert the top of the battery pack into the top of the battery mounting surface.
(2) Push the battery pack so that it attaches firmly.



Removing the Battery Pack

Slide BATT, and then pull the lower part of the battery pack.



Inserting a Cassette

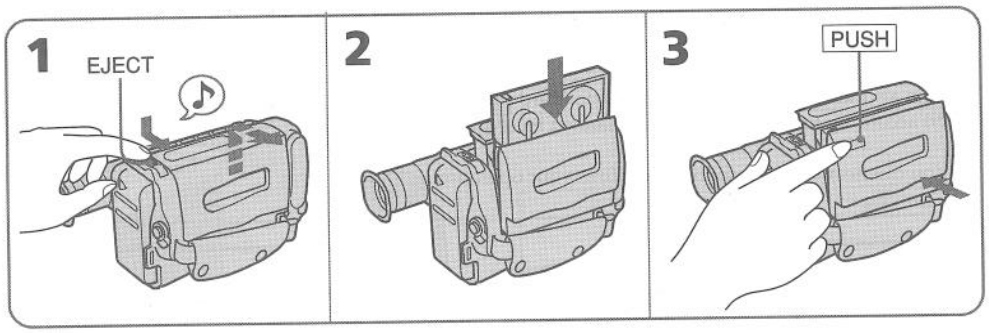
Make sure that a power source is installed.

(1) While pressing the small blue button, slide EJECT in the direction of the arrow. The cassette compartment automatically opens.

(2) Insert a cassette (not supplied) with the window facing out.

(3) Press the PUSH mark on the cassette compartment to close it. The cassette compartment automatically closes.

♪: You can hear the beep sound to confirm your operation.



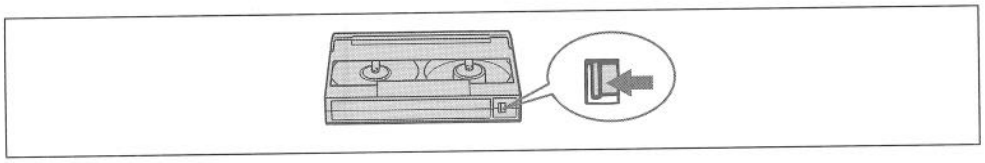
To Eject the Cassette

While pressing the small blue button, slide EJECT in the direction of the arrow.

To Prevent Accidental Erasure

Slide the tab on the cassette to expose the red mark.

If you insert the cassette with the red mark exposed and close the cassette compartment, the beeps sound for a while. If you try to record with the red mark exposed, the and ⏏ indicators flash in the viewfinder, and you cannot record on the tape. To re-record on this tape, slide the tab back out to cover the red mark.



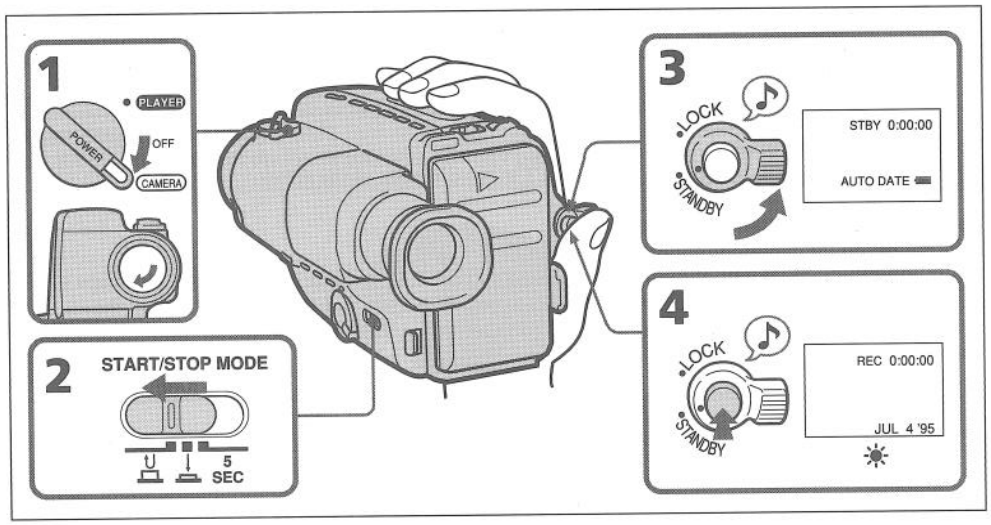
Camera Recording

Make sure that a power source and a cassette is inserted.
When you use the camcorder for the first time, power on it and reset the date and time to your time (p. 33) before you start recording. When you reset the date and time, the date is automatically recorded for 10 seconds after you start recording (AUTO DATE feature). This feature works only once a day.
Before you record one-time events, you may want to make a trial recording to make sure that you are using the camcorder correctly.

(1) While pressing the small green button on the POWER switch, turn it to CAMERA.
(2) Slide the START/STOP MODE switch to .
(3) Turn STANDBY up. The "STBY" indicator appears in the viewfinder.
(4) Press START/STOP (red button). The camcorder starts recording and the "STBY" indicator changes to the "REC" indicator.

You can also select Recording mode, SP (standard play) mode or LP (long play) mode. Set REC MODE (p. 29) according to the length of your planned recording before you start.

♪: You can hear the beep sound to confirm your operation.

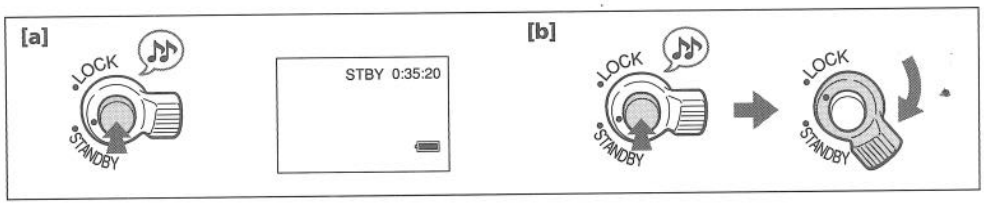


To Stop Recording Momentarily [a]

Press START/STOP again. The "REC" indicator in the viewfinder changes to the "STBY" indicator (**Standby mode**).

To Finish Recording [b]

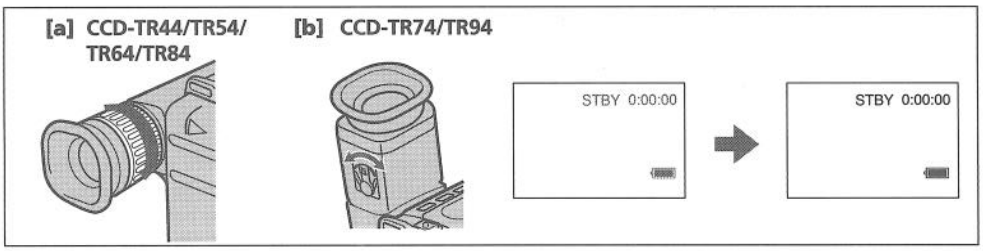
Press START/STOP. Turn STANDBY down, and set the POWER switch to OFF.
Then, eject the cassette (p. 11) and remove the battery (p. 10).



Note on Standby mode
If you leave the camcorder for 5 minutes or more with a cassette inserted in Standby mode, the camcorder goes off automatically. This prevents wearing down the battery and wearing out the tape. To resume Standby mode, turn STANDBY down once and turn it up again. To start recording, press START/STOP.

To Focus the Viewfinder Lens

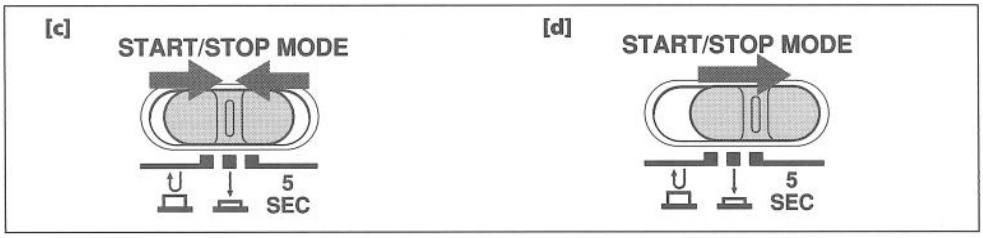
If the viewfinder is not in focus at all or when you use the camcorder after someone else has used it, focus the viewfinder lens. When using a monochrome viewfinder, turn the viewfinder lens adjustment ring so that the indicators in the viewfinder come into sharp focus **[a]**. When using a color viewfinder, move the viewfinder lens adjustment lever so that the indicators in the viewfinder come into sharp focus **[b]**.



Note on the indicators in the viewfinder
The indicators appear in CAMERA mode only. They do not appear in PLAYER mode.

Recording with the START/STOP button depressed
You can also make recording while pressing down the START/STOP button. To make the START/STOP button work this way, slide the START/STOP MODE switch to ⊥ . **[c]**

Shooting scenery in several short takes
You can automatically make recording for about 5 seconds with the 5 SEC (p. 26). To make the START/STOP button work this way, slide the START/STOP MODE switch to 5 SEC. **[d]**



Note on recording

When you record from the beginning of the tape, run the tape for about 15 seconds before actual recording. This prevents the camcorder from missing any start-up scenes when you play back the tape.

Notes on recording mode

- This camcorder records in the SP mode (approximately 19/32 inch (1.43 cm)/second) and in the LP mode (approximately 5/16 inch (0.72 cm)/second) (p. 29) and can play back in the SP mode and LP mode. The playback quality in the LP mode, however, will not be as good as that in the SP mode.
- When a cassette recorded on this camcorder in LP mode is played back on other types of 8 mm camcorders or VCRs, the playback quality may not be as good as that on this camcorder.

Notes on the tape counter

- The tape counter indicates the recording time. Use it as a guide. There will be a time lag of several seconds from the actual time. To set the counter to zero, press COUNTER RESET located below the viewfinder.
- If the tape is recorded in SP and LP modes mixed, the tape counter shows incorrect recording time. When you intend to edit the tape using the tape counter, record in same (SP or LP) mode.

Note on beep sound

As indicated with ♪ in the illustrations, a beep sounds when you turn the power on or when you start recording and two beeps sound when you stop recording, confirming the operation. Several beeps also sound as a warning of any unusual condition of the camcorder (p. 55). Note that the beep sound is not recorded on the tape. If you do not want to hear the beep sound, set BEEP to "OFF" (p. 29).

Note on the AUTO DATE feature

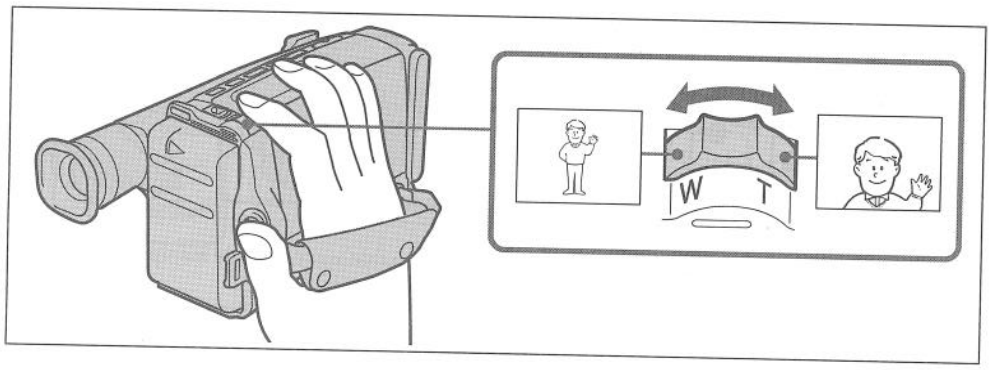
The clock is set to the East Coast Standard Time at the factory. You can reset the clock (p. 33).
The AUTO DATE feature works once a day. However, the date may automatically appear more than once a day when:
– you reset the date and time.
– you eject and insert the cassette again.
– you stop recording within 10 seconds.

When moving from indoors to outdoors (or vice versa)

Turn STANDBY up and point the camcorder at a white object for about 15 seconds so that the white balance is properly adjusted.

Using the Zoom Feature

Zooming is a recording technique that lets you change the size of the subject in the scene. For more professional-looking recordings, use the zoom sparingly.
T side: for telephoto (subject appears closer)
W side: for wide-angle (subject appears farther away)



Zooming Speed

Turn the power zoom lever fully for a high-speed zoom. Turn it lightly for a relatively slow zoom.

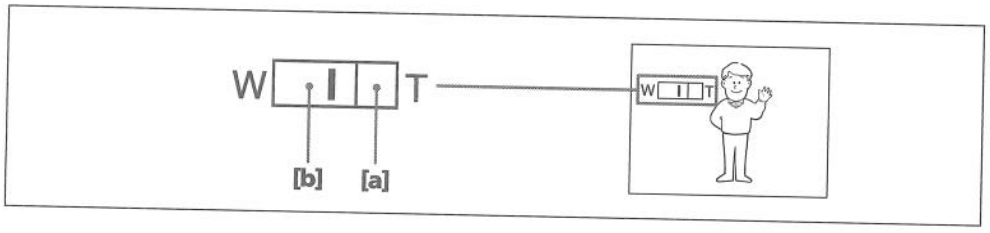
When you shoot a subject using a telephoto zoom

If you cannot get a sharp focus while in extreme telephoto zoom, turn the power zoom lever towards the W side until the focus is sharp.
You can shoot a subject that is at least 2.6 feet (about 80 cm) away from the lens surface in the telephoto position, or 1/2 inch (about 1 cm) in the wide-angle position.

Notes on Digital Zoom (for CCD-TR74/TR84/TR94 only)

You can select 12 x or 24 x of zooming.

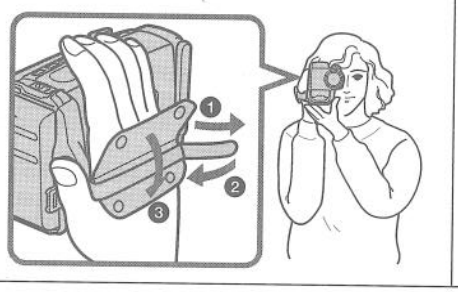
- More than 12 x zoom is performed digitally, and the picture quality deteriorates as you go toward the T side. If you do not want to use the digital zoom set the ZOOM function to x12 (p. 29).
- The vertical bar in the power zoom indicator separates the digital zooming zone (right side of the bar **[a]**) and the optical zooming zone (left side of the bar **[b]**). If you slide the ZOOM switch to x12, the right side of the bar **[a]** disappears.



Hints for Better Shooting

For hand-held shots, you'll get better results holding the camcorder according to the following suggestions:

[a]



[b]

- Hold the camcorder firmly and secure it with the grip strap so that you can easily manipulate the controls with your thumb. **[a]**
- Place your right elbow against your side.
- Place your left hand under the camcorder to support it. Do not cover the microphone with your fingers.
- Place your eye firmly against the viewfinder eyecup.
- Use the viewfinder frame as a guide to determine the horizontal plane.
- You can also record in a low position to get an interesting recording angle. Turn the viewfinder up for recording from a low position. **[b]**

Place the camcorder on a flat surface or use a tripod

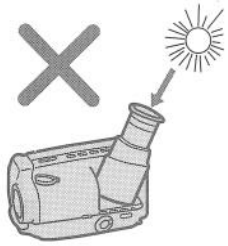
Try placing the camcorder on a table top or any other flat surface of suitable height. If you have a tripod for a still camera, you can also use it with the camcorder.
When attaching a non-Sony tripod, make sure the tripod screw is shorter than 9/32 inch (6.5 mm). Otherwise, the screw may damage the inner parts of the camcorder.

Cautions on the viewfinder

- Do not pick up the camcorder by the viewfinder. **[c]**
- Do not place the camcorder so as to point the viewfinder toward the sun. The inside of the viewfinder may be deformed. Be careful in placing the camcorder under sunlight or by the window. **[d]**

[c]

[d]



Checking the Recorded Picture

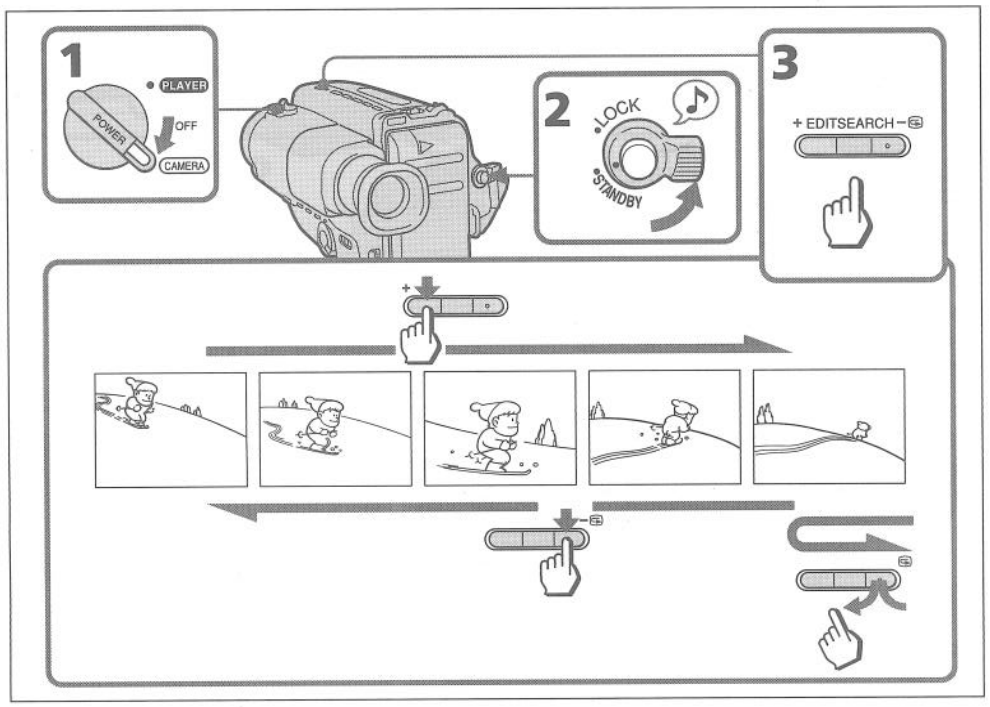
Using EDITSEARCH, you can review the last recorded scene or check the recorded picture in the viewfinder.

(1) While pressing the small green button on the POWER switch, turn it to CAMERA.

(2) Turn STANDBY up.

(3) Press EDITSEARCH. Press the – (⏪) side momentarily, the last few seconds of the recorded portion plays back **(Rec Review)**.

Hold down the – side of EDITSEARCH until the camcorder goes back to the scene you want. The last recorded portion is played back. To go forward, hold down the + side (**Editsearch**).



To Begin Re-recording

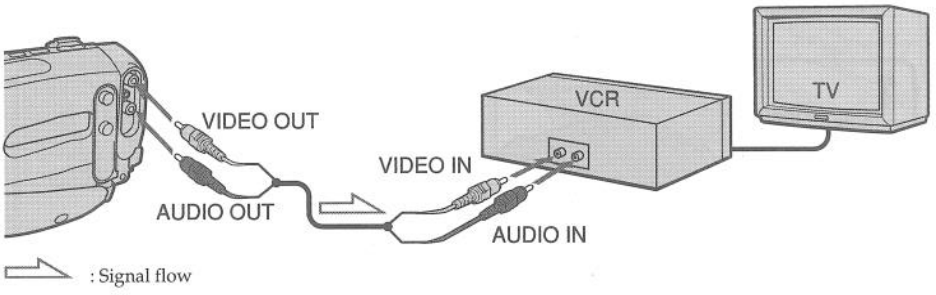
Press START/STOP. Re-recording begins from the point you released EDITSEARCH. Provided you do not eject the cassette, the transition between the last scene you recorded and the next scene you record will be smooth.

Connections for Playback

You can use this camcorder as a VCR by connecting it to your TV for playback. It is recommended to use the house current as the power source (p. 21).

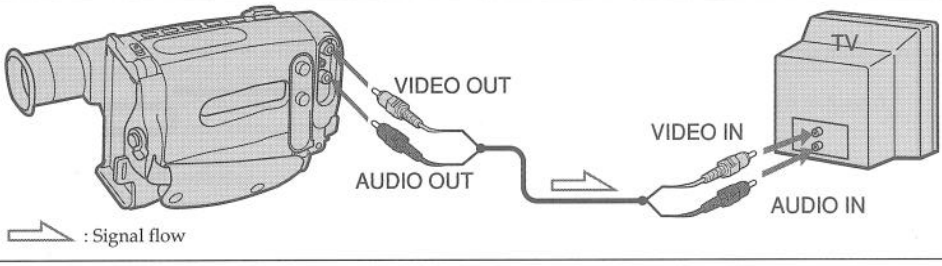
If a VCR is connected to a TV

Connect the camcorder to LINE IN on the VCR by using the supplied A/V connecting cable. Set the input selector on the VCR to LINE. Set the TV/VCR selector to VCR on the TV.



Connecting Directly to a TV

Connect the camcorder to your TV by using the the supplied A/V connecting cable. Set the TV/VCR selector to VCR on the TV.



To Connect a TV or a VCR without Video/Audio Input Jacks

Use the RFU-95UC RFU adaptor (not supplied).

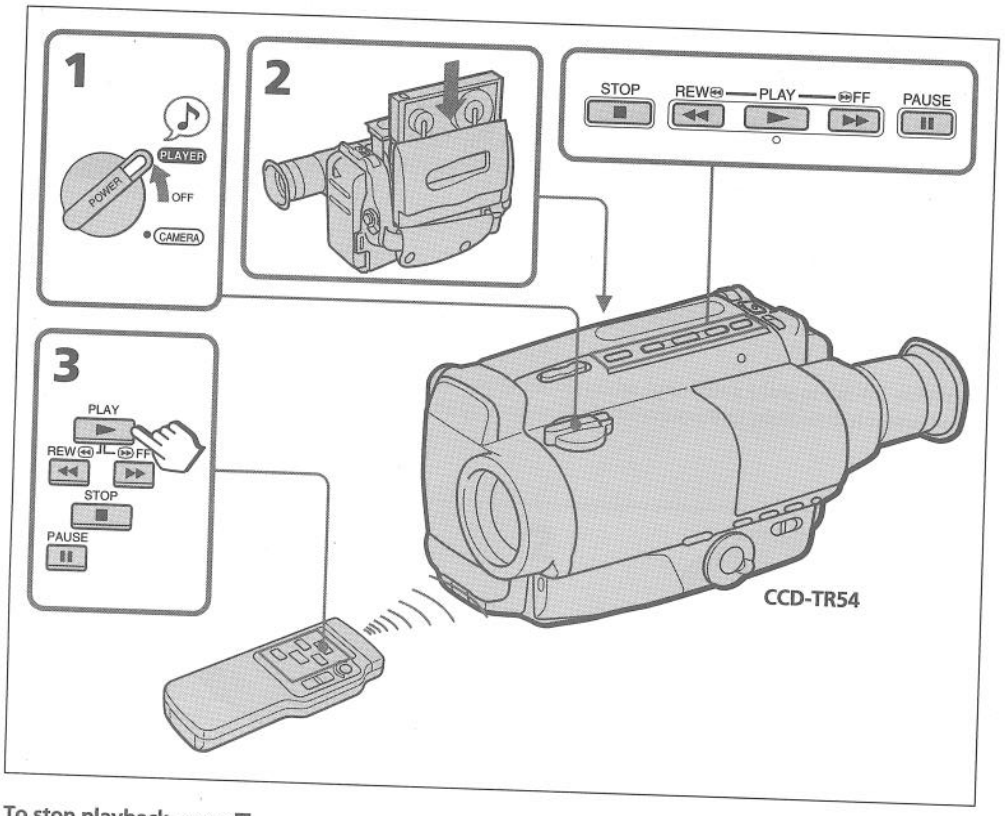
Playing Back a Tape

You can monitor the playback picture in the viewfinder. You can also monitor on the TV screen, after connecting the camcorder to the TV/VCR (p. 18).
You can control playback using the supplied Remote Commander* (For CCD-TR54/TR64/TR74/TR84/TR94 only, p. 51).

*** For CCD-TR44 users:**
The Remote Commanders are available on option.

(1) While pressing the small green button on the POWER switch, turn it to PLAYER.
(2) Insert the recorded tape with the window facing out.
(3) Press ►. Playback starts.

♪: You can hear the beep sound to confirm your operation.



To stop playback, press ■.
To rewind the tape, press ◄◄.
To fast-forward the tape, press ►►.

See the next page for further informations.

Playing Back a Tape

Various Playback Modes

To view a still picture (playback pause)

Press II during playback. To resume playback, press II or ►.

To locate a scene (Picture Search)

Keep pressing ◄◄ or ►► during playback. To resume normal playback, release the button.

To monitor the high-speed picture during fastforward or rewind (Skip Scan)

Keep pressing ◄◄ while rewinding or ►► while advancing the tape. To resume normal playback, press ►.

To view the picture in a sequence of stop-motion images

Press EDITSEARCH in playback pause mode. If you keep pressing EDITSEARCH, you can view the picture playback in the forward (+) or reverse (–) direction.

Notes on playback

- Streaks appear and the sound is muted in the various playback modes.
- When still picture mode lasts for 5 minutes or more, the camcorder automatically enters stop mode.

Using Alternative Power Sources

You can choose any of the following power sources for your camcorder: battery pack (P.7), the house current, alkaline battery, and 12/24 V car battery. Choose the appropriate power source depending on where you want to use your camcorder.

Place	Power source	Accessory to be used
Indoors	House current	Supplied AC power adaptor
Outdoor	Battery pack	Battery pack NP-33 (supplied), NP-98/98D, NP-80/80D, NP-68, NP-66H, NP-C65, NP-60D
	Size AA (LR 6) Alkaline battery	Battery case (supplied)
In the car	12 V or 24 V car battery	DC pack DCP-77

GENUINE VIDEO ACCESSORIES

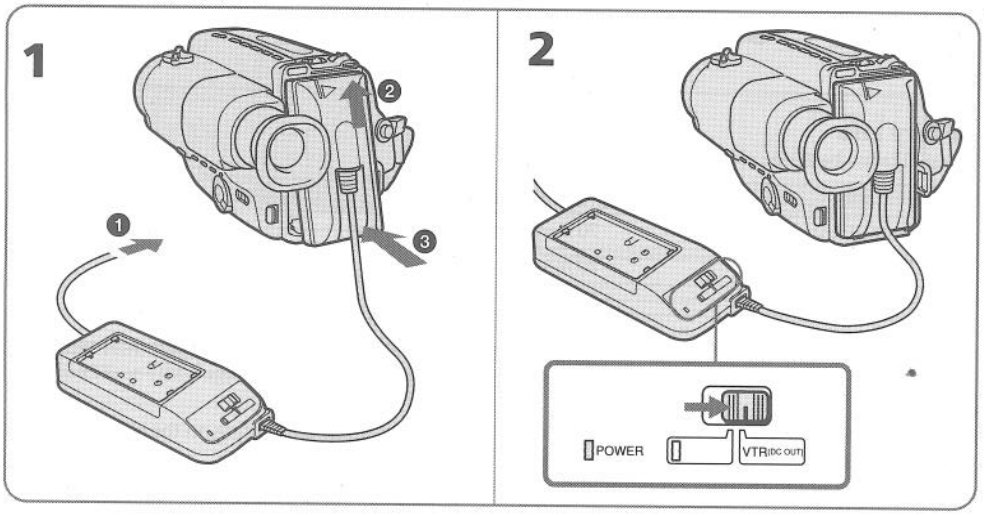
This mark indicates that this product is a genuine accessory for Sony video products. When purchasing Sony video products, Sony recommends that you purchase accessories with this "GENUINE VIDEO ACCESSORIES" mark.

Using the House Current

To use the supplied AC power adaptor:

(1) Connect the AC power cord to a wall outlet. Insert the top of the connecting plate of the AC power adaptor into the top of to the battery mounting surface. Push the connecting plate so that it attaches firmly.

(2) Set the selector to VTR (DC OUT).



Using Alternative Power Sources

WARNING

AC power cord must only be changed at qualified service shop.

PRECAUTIONS

The set is not disconnected from the AC power source (mains) as long as it is connected to the wall outlet, even if the set itself has been turned off.

Notes on the POWER lamp

- The POWER lamp will remain lit for a while even if the unit is unplugged after use. This is normal.
- If the POWER lamp does not light, set the selector to VTR (DC OUT) and disconnect the AC power cord. After about one minute, try again.

To remove the adaptor

The adaptor is removed in the same way as the battery pack (p. 10).

Using the Battery Case

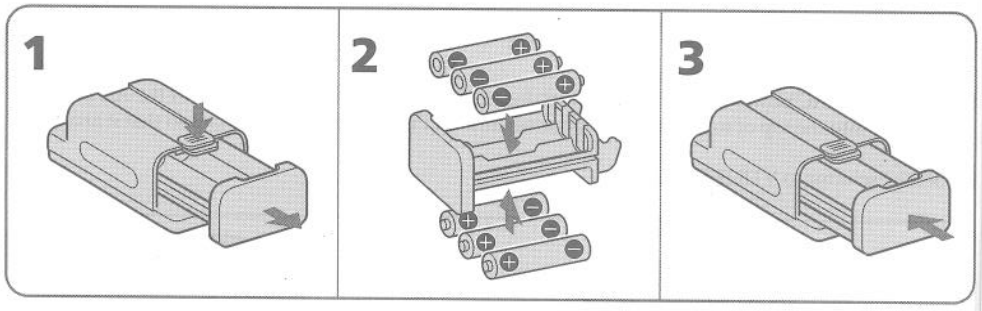
Use the battery case (supplied) and six size AA (LR 6) alkaline batteries (not supplied).

(1) Remove the battery holder from the battery case.

(2) Insert six new alkaline batteries into the battery holder, following the marking on the holder to be sure the batteries are installed in the correct direction.

(3) Insert the battery holder with the alkaline batteries.

(4) Insert the battery case with the alkaline batteries to the battery mounting surface of the camcorder in the same way as the battery pack (p. 10).



Battery Life

Using alkaline batteries at 77 °F (25 °C)

Model	Typical recording time	Continuous recording time
CCD-TR44/TR54	70 min.	125 min.
CCD-TR64	70 min.	125 min.
CCD-TR74	60 min.	110 min.
CCD-TR84	55 min.	100 min.
CCD-TR94	55 min.	100 min.

Notes

- The above battery lives are estimates. The battery life may be shorter depending on the storage condition of the battery before being purchased and temperature.
- You may not use the battery case in cold environment.

To remove the battery case

The battery case is removed in the same way as the battery pack (p. 10).

When you replace the batteries, be sure to remove the battery case from the camcorder to prevent malfunction.

Using a Car Battery

Use the DCP-77 DC pack (not supplied). Connect the cord of the DC pack to the cigarette lighter socket of a car (12 V or 24 V). Connect the DC pack to the battery mounting surface of the camcorder.

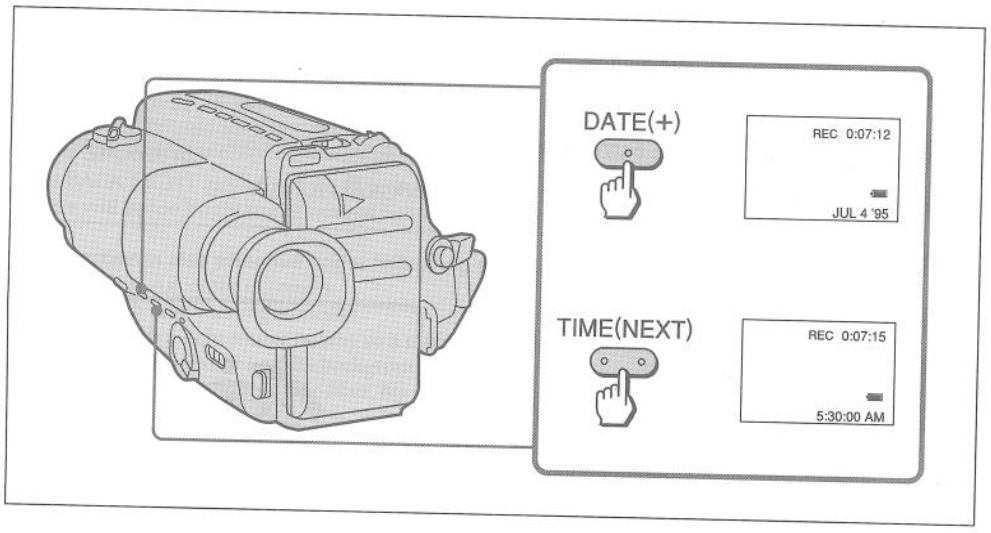
To remove the DC pack

The DC pack is removed in the same way as the battery pack (p. 10).

Recording with the Date or Time

Before you start recording, press DATE or TIME. You can record the date or time displayed in the viewfinder with the picture. You cannot record the date and time at the same time. Except for the date or time indicator, no indicator in the viewfinder is recorded.

The clock is set to the East Coast Standard Time at the factory.



To Stop Recording with the Date or Time

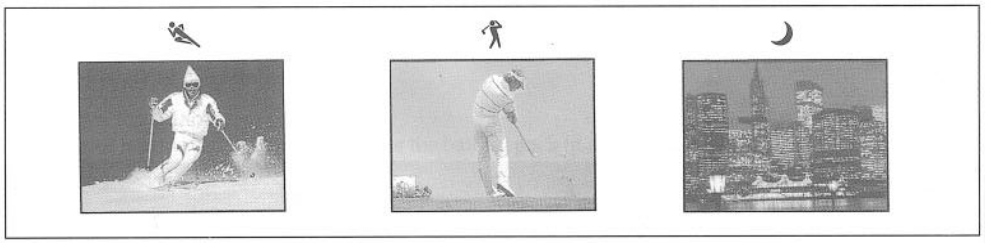
Press DATE or TIME again. Recording continues.

Using the PROGRAM AE Function

You can select from three PROGRAM AE (Auto Exposure) modes to suit your shooting situation. When you use PROGRAM AE, you can capture high-speed action or night views.

Selecting the Best Mode

Select the best mode by using the following examples.



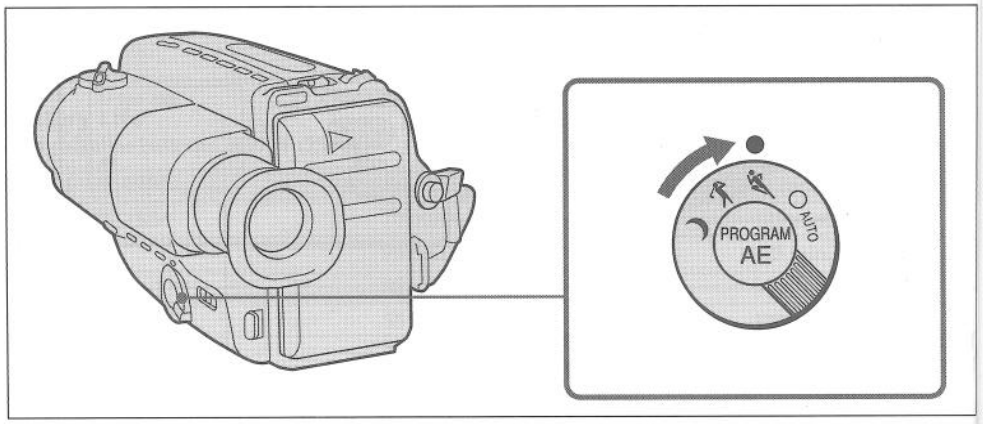
Sports mode
- Outdoor sports scenes such as football, tennis, golf or skiing
- A landscape in a moving car

High-speed shutter mode
- A golf swing or a tennis match in fine weather with the ball captured clearly
- Playing back certain scenes with high-speed movements in clear, sharp picture

Twilight mode
- Recording night views, neon signs or fireworks

Using the PROGRAM AE Function

Set the mark of the desired mode to the ● mark above the PROGRAM AE dial.



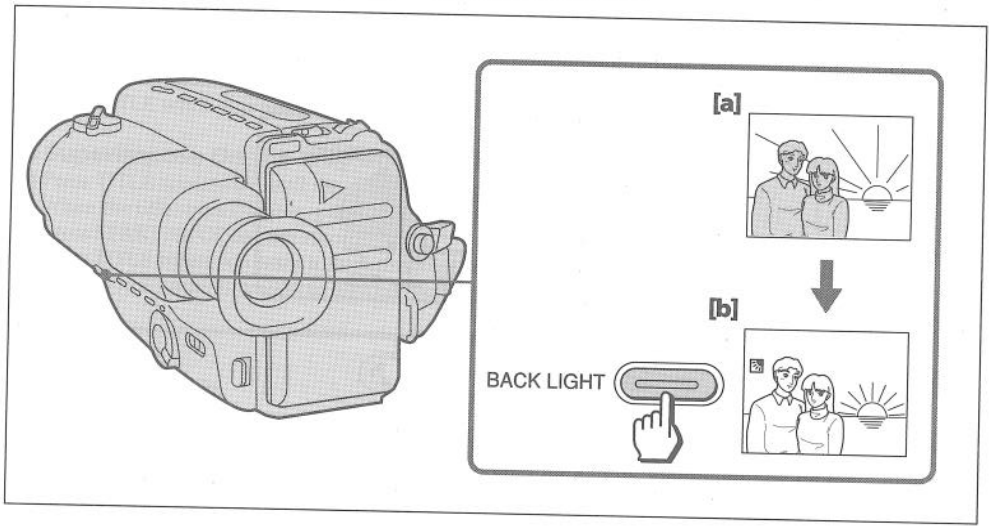
Note on shutter speed

The shutter speed in each PROGRAM AE mode is as follows:
Sports mode – between 1/60 to 1/500
High-speed shutter mode – 1/4000
Twilight mode – 1/60
AUTO mode – 1/60

Shooting with Backlighting

When you shoot a subject with the light source behind the subject or a subject with a light background, use the BACK LIGHT.

Press BACK LIGHT. The ▣ indicator appears inside the viewfinder.



[a] Subject is too dark because of backlight.
[b] Subject becomes bright with backlight compensation.

After Shooting

Press BACK LIGHT again to let the ▣ indicator go out under normal lighting condition. Otherwise, the picture will be too bright under normal lighting condition.

This function is also effective under following conditions:

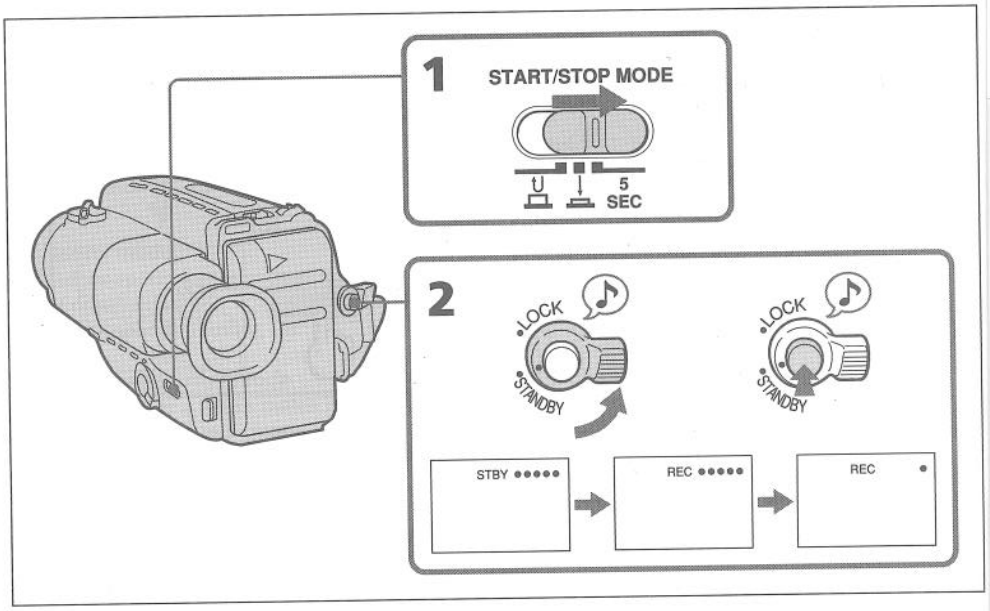
- On the snow e.g. at the ski resort
- At the beach under strong sunshine
- A subject with a light source nearby or a mirror reflecting light
- A white subject against a white background. Especially when you shoot a person wearing shiny clothes made of silk or synthetic fiber, his or her face tends to become dark if you do not use this function.

Shooting Scenery in Several Short Takes

Long, continuous shots of scenery tend to be dull, and have to be edited to make an interesting video. With the 5 SEC (5-second recording) mode, the camcorder records for about 5 seconds and then switches to Standby mode, so that you will automatically take a series of quick shots resulting in a lively video.

(1) Slide the START/STOP MODE switch to 5 SEC.

(2) Turn STANDBY up and press START/STOP. Recording starts. Five dots appears in the viewfinder. The dots disappear at a rate of one per second. When five seconds elapse and all the dots disappear, the camcorder switches to Standby mode automatically.



To Extend the Recording Time

Press START/STOP again before all the dots disappear. Recording continues for about 5 seconds from the moment you press START/STOP.

To Cancel 5-Second Recording

Slide the START/STOP MODE switch to ⏚ (normal recording). If you slide the switch while recording, recording continues.

Superimposing a Title

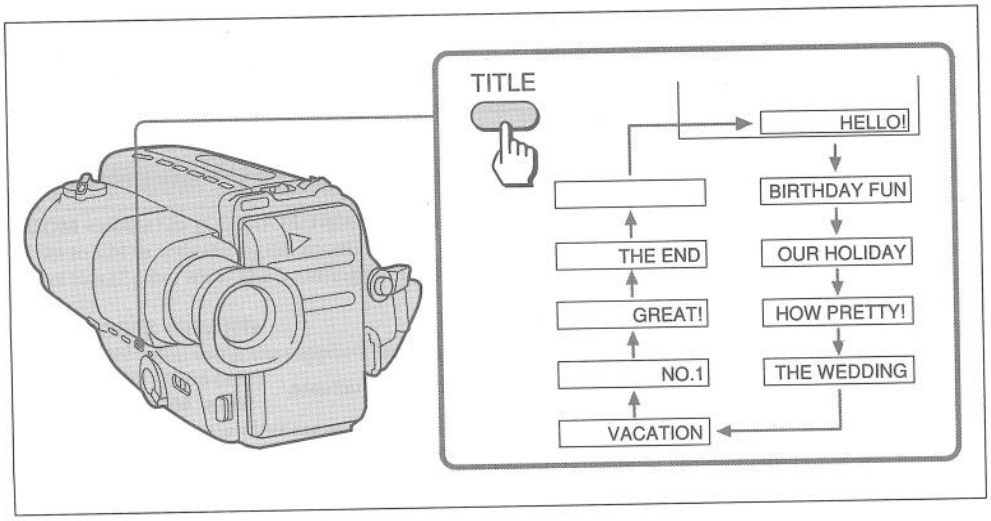
You can select from nine preset titles to superimpose it on the picture during recording. Each time you press TITLE, the preset titles appear one by one.

To Superimpose from the Beginning

(1) Turn the POWER switch to CAMERA.
(2) Turn STANDBY up.
(3) Press TITLE repeatedly until the desired title appears. The title flashes.
(4) Press START/STOP to start recording.
(5) Press TITLE when you want to turn off the title.

To Superimpose On the Way of Recording

(1) Press TITLE repeatedly until the desired title appears. The title flashes.
(2) When the title stops flashing, press TITLE. The title disappears.
(3) Press START/STOP to start recording.
(4) Press TITLE when you want to superimpose the title.
(5) Press TITLE when you want to turn off the title.



Note on selecting a title
You cannot select a title during recording.

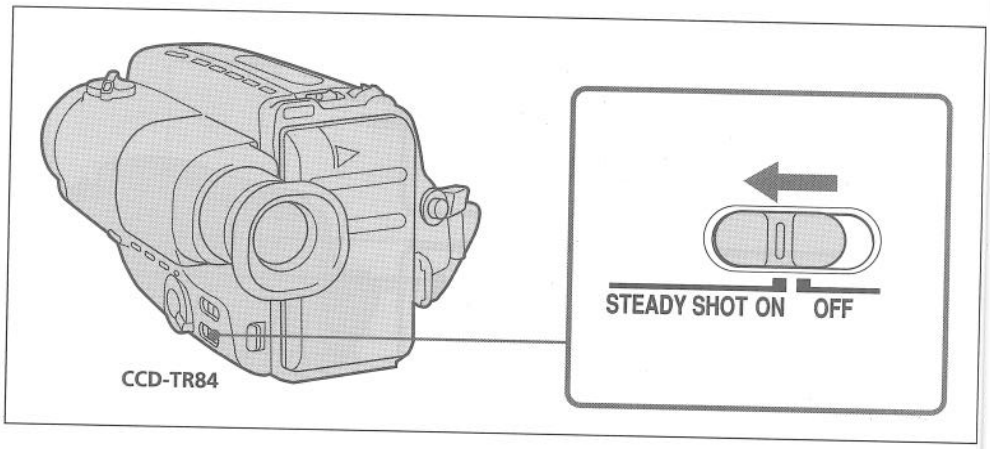
Using the STEADY SHOT Function

— CCD-TR84/TR94 only

You can use the Steady Shot to compensate for camera-shake. Do not use the Steady Shot when shooting a stationary object with a tripod.

Using the STEADY SHOT Function

Slide STEADY SHOT to ON.



To Release the Steady Shot

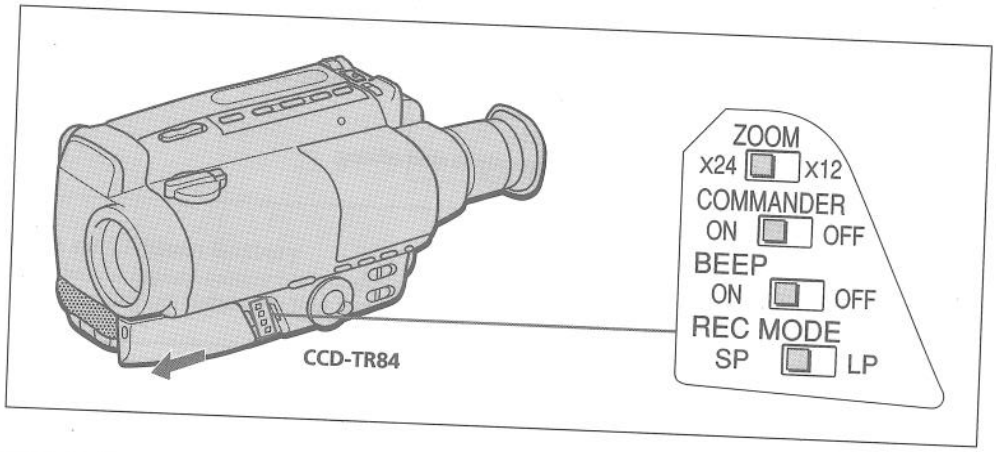
Slide STEADY SHOT to OFF.

Notes on the Steady Shot

- The Steady Shot will not correct excessive camera-shake.
- When you switch the Steady Shot on or off, the exposure may fluctuate.

Changing the Mode Settings

You can change the mode settings to further enjoy the features and functions.
(1) Slide the cover to the left. You will find the mode switches.
(2) Set the mode switches to the desired mode.
(3) Close the cover.



Selecting the Mode Setting of Each Item

ZOOM <x24/x12> (CCD-TR74/TR84/TR94 only)
- Set to x24 to activate digital zooming.
- Set to x12 otherwise. The zooming ability becomes x12.

COMMANDER <ON/OFF>
- Set to ON when using the supplied Remote Commander* for the camcorder (For CCD-TR54/TR64/TR74/TR84/TR94 only).
  *** For CCD-TR44 users:**
  The Remote Commanders are available on option.
- Set to OFF when not using the Remote Commander for the camcorder.

BEEP <ON/OFF>
- Set to ON to turn the beep sound on.
- Set to OFF to turn the beep sound off.

REC MODE <SP/LP>
- Select SP to record a tape in SP (standard play) mode.
- Select LP to record a tape in LP (long play) mode.

Editing onto Another Tape

You can create your own video program by editing with any other 8 8 mm, Hi8 Hi8, VHS VHS, S-VHS S-VHS, VHSC VHSC, S-VHSC S-VHSC, β Betamax or ED Beta ED Betamax VCR that has video/audio inputs.

After connecting the camcorder to the VCR (p. 18),

(1) Turn the POWER switch to PLAYER.

(2) Insert a blank tape (or a tape you want to record over) into the recording VCR. Then insert your recorded tape into the camcorder.

(3) Play back the recorded tape on the camcorder until you locate the point where you want to start editing. Then set the camcorder to playback pause mode.

(4) Set the recording VCR to recording pause mode.

(5) Press II on the camcorder and VCR simultaneously to start editing.

To Edit More Scenes

Repeat steps 3 to 5.

To Stop Editing

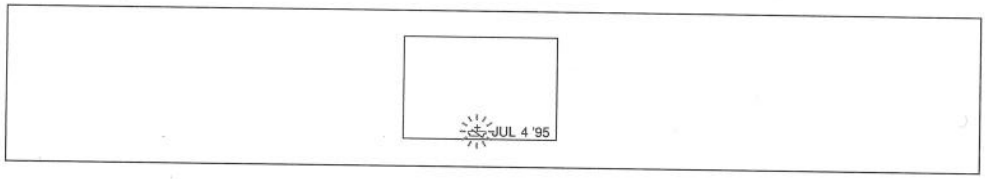
Press ■ STOP on the camcorder and VCR.

Use of the EDITSEARCH button

To play back a tape in the forward or reverse direction keep pressing EDITSEARCH during playback pause. You can play back still pictures successively at specific intervals by pressing EDITSEARCH intermittently.

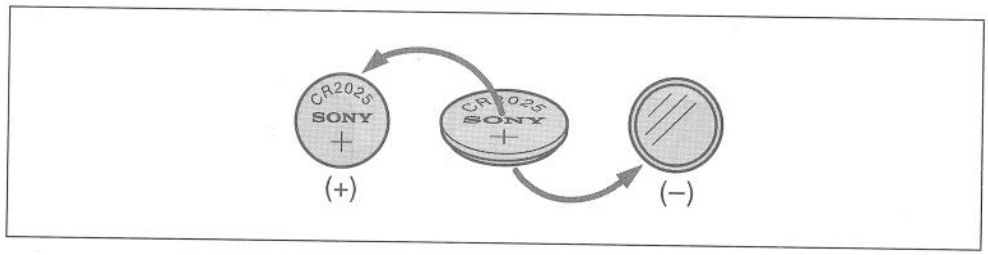
Changing the Lithium Battery In the Camcorder

Your camcorder is supplied with the lithium battery installed. The lithium battery lasts for about 1 year under normal operation. When the battery becomes weak or dead, ⚠ indicator flashes in the viewfinder for about 5 seconds when you set the POWER switch to CAMERA. In this case, **replace the battery with the Sony CR2025 or Duracell DL-2025 lithium battery. Use of another battery may present a risk of fire or explosion.**



Note on Lithium Battery

Note that the lithium battery has a positive (+) and a negative (–) terminals as illustrated. **Be sure to install the lithium battery so that terminals on the battery match the terminals on the camcorder.**



WARNING

The battery may explode if mistreated. Do not recharge, disassemble, or dispose of in fire.

Caution

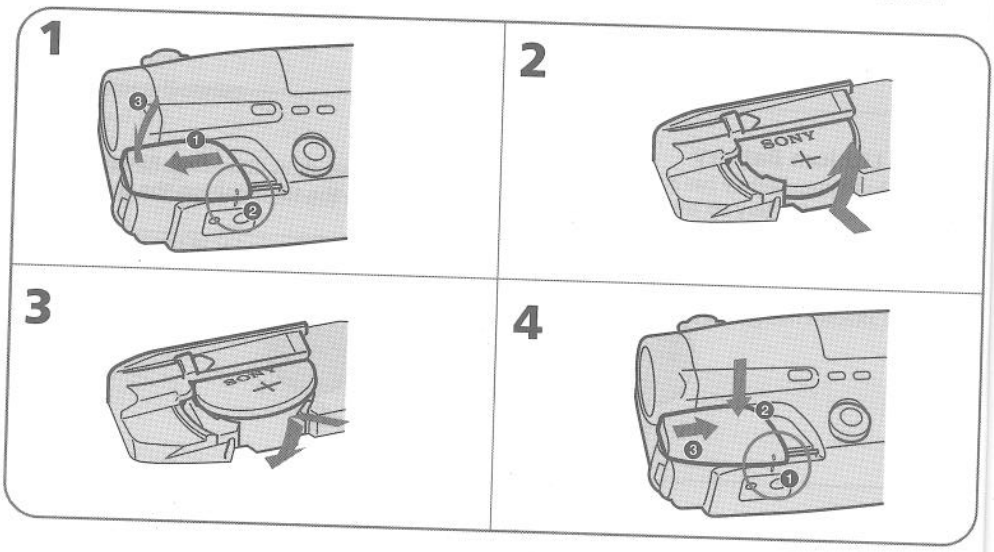
Keep the lithium battery out of the reach of children. Should the battery be swallowed, consult a doctor immediately.

Changing the Lithium Battery In the Camcorder

Changing the Lithium Battery

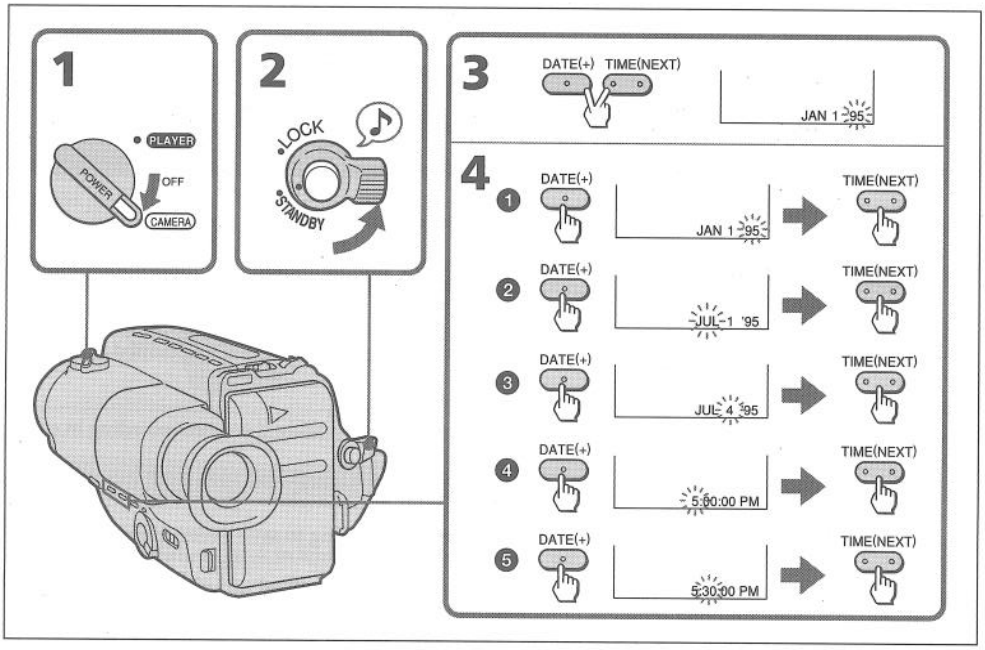
When replacing the lithium battery, keep the battery pack or other power source attached. Otherwise, you will need to reset the date and time .

(1) Slide the cover and align the mark of the cover to that of the body. Press down the cover.
(2) Push the battery in once and pull it out from the holder.
(3) Install the lithium battery with the positive (+) side facing out.
(4) Align the mark of the cover to that of the body. Press the cover until it clicks and slide the cover.



Resetting the Date and Time

Reset the date and time using the DATE(+) and TIME(NEXT) buttons.
(1) Turn the POWER switch to CAMERA.
(2) Turn STANDBY up.
(3) Press DATE(+) and TIME(NEXT) simultaneously until the year indicator flashes in the viewfinder.
(4) Set year, month, day, time, minute by pressing DATE(+) and TIME(NEXT). Note that when you keep DATE(+) pressed, the digits advance faster.



To Correct the Date and Time Setting

Repeat steps 3 and 4.

To Check the Date and Time

Press DATE to display the date indicator in the viewfinder. Press TIME to display the time indicator. When you press the same button again, the indicator goes out.

The year indicator changes as follows:

'95 → '96 ····· → '24

Note on the time indicator

The internal clock of the camcorder operates on a 12-hour cycle.
12:00:00 AM stands for midnight.
12:00:00 PM stands for noon.

Playback Modes

The playback mode is selected automatically according to the recording system (SP/LP mode) in which the tape was recorded.

Foreign 8 mm video
You cannot play software recorded on a different TV color system. Because the TV color systems differ from country to country, you may not be able to play back foreign pre-recorded software. Refer to page 42 to check the TV color system of foreign countries.

Tips for Using the Battery Pack

This section shows you how you can get the most out of your battery pack.

Preparing the Battery Pack

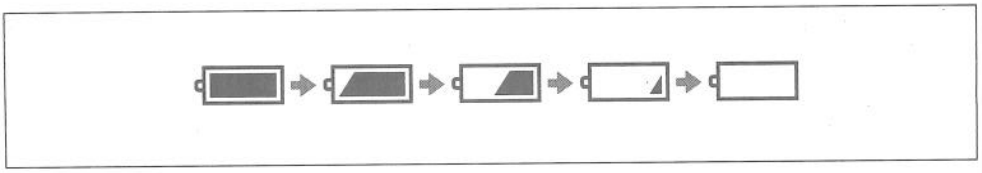
Always Carry Additional Batteries
Have sufficient battery pack power to do 2 to 3 times as much recording as you have planned.

Battery Life is Shorter in Cold Environment
Battery efficiency is decreased and the battery will be used up more quickly if you are recording in cold environment.

To Save Battery Power
Turn the STANDBY switch on the camcorder down when not recording to save battery power. **[a]** on page 35.
A smooth transition between scenes can be made even if recording is stopped and started again. While positioning the subject, selecting an angle, or looking through the viewfinder lens, the lens moves automatically and the battery is used. The battery is also used when a cassette is inserted or removed.

When to Replace the Battery

While you are using your camcorder in CAMERA mode, the remaining battery indicator decreases gradually as battery power is used up.

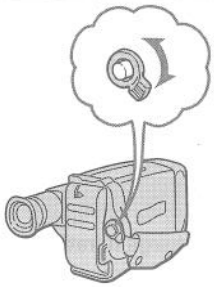


Tips for Using the Battery Pack

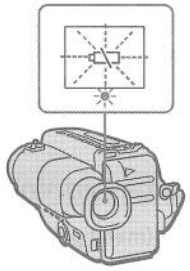
When the remaining battery indicator reaches the lowest point, the ⌧ indicator appears and starts flashing in the viewfinder. **[b]**
When the ⌧ indicator in the viewfinder changes from slow flashing to rapid flashing while you are recording, turn the POWER switch to OFF on the camcorder and replace the battery pack. Leave the tape in the camcorder to obtain smooth transition between scenes after the battery is replaced.

Note on the remaining battery indicator
The remaining battery indicator of the camcorder may indicate a different remaining capacity from that of the battery pack with the remaining battery indicator (not supplied). The indicator of the battery pack is more accurate.

[a]



[b]



Notes on the Rechargeable Battery Pack

Caution
Never leave the battery pack in temperatures above 140 °F (60 °C), such as in a car parked in the sun or under direct sunlight.

The Battery Heats Up
During charging or recording, the battery pack heats up. This is caused by energy that has been generated and a chemical change that has occurred inside the battery pack. This is not cause for concern.

Battery Pack Care
- Remove the battery pack from the camcorder after using the battery pack, and keep it in a cool place. When the battery pack is attached to the camcorder, a small amount of current flows to the camcorder even if the POWER switch is set to OFF, which shortens battery life.
- The battery pack is always discharging even when it is not in use after charging. Therefore, you should charge the battery right before using the camcorder.

How to Use the Switch on the Battery Pack
When the switch is supplied with the battry pack (**[c]** on p. 36) you can use it to find whether the battery pack is charged or not. Set the switch to the "no mark" position when charging is completed. Set the switch to the "red mark" position when the battery is used up (or in whichever direction you want to remind yourself).

The Life of the Battery Pack
If the ⌧ indicator flashes rapidly just after turning on the camcordrer with a fully charged battery pack, the battery pack should be replaced with a new fully charged one.

Tips for Using the Battery Pack

Charging Temperature

You should charge batteries at temperatures from 50°F to 86°F (from 10°C to 30°C). Lower temperatures require a longer charging time.

Sony Batteries are Recommended

Use of non-Sony batteries may damage your Handycam camcorder.

Notes on Charging

A Brand-new Battery

A brand-new battery pack is not charged. Before using the battery pack, charge it completely.

After Long Storage

Recharge the battery pack after a long period of storage. If the battery pack is charged fully but not used for a long time (about 1 year), it becomes discharged. Charge it again, but in this case the battery life will be shorter than normal. After several charging and discharging cycles, the battery life will recover its original capacity.

Notes on the Terminals

If the terminals (metal parts on the back) are not clean, the battery charge duration will be shortened.

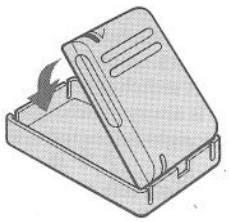
When the terminals are not clean or when the battery pack has not been used for a long time, repeat installing and removing the battery pack a few times. This improves the contact condition. Also, wipe the + and – terminals with a soft cloth or paper.

Be Sure to Observe the Following

- **To prevent an accident caused by a short circuit, do not allow metal objects such as a necklace to touch the battery terminals. Carry the battery pack attaching to the terminal cover. [d]**
- Keep the battery pack away from fire.
- Keep the battery pack dry.
- Do not open nor convert the battery pack.
- Do not expose the battery pack to any mechanical shock.

[c]

[d]



Notes on the Battery Case

- **Use only with alkaline batteries. You cannot use the battery case with manganese batteries or size AA rechargeable NiCd batteries.**
- Battery life is remarkably shorter in a cold environment (lower than 50 °F/10 °C).
- Keep the metal part clean. If it gets dirty, wipe it with a soft cloth.
- Do not disassemble or convert the battery case.
- Do not expose the battery case to any mechanical shock.
- During recording, the battery case heats up. This is not cause for concern.
- Prevent the electrode in the battery case from coming in contact with a metal object.
- If you will not use the battery case for a long time, detach the battery case from the camcorder and remove the batteries from the battery case.

Notes on Alkaline Batteries

To avoid possible damage from battery leakage or corrosion, observe the following.

- Be sure to insert the batteries in the correct direction.
- Alkaline batteries are not rechargeable.
- Do not use a combination of new and old batteries.
- Do not use different types of batteries.
- The batteries slowly discharge while not in use.
- Do not use a battery that is leaking.

If battery leakage occurred

- Wipe off the liquid in the battery case carefully before replacing the batteries.
- If you touch the liquid, wash it off with water.
- If the liquid get into your eyes, wash your eyes with a lot of water and then consult a doctor.

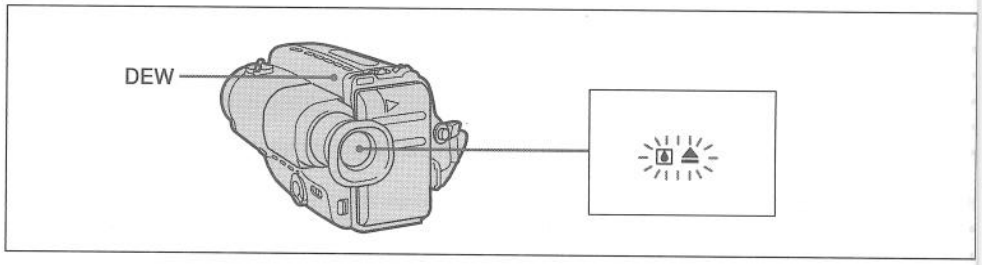
Maintenance Information and Precautions

Moisture Condensation

If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape, or on the lens. If this happens, the tape may stick to the head drum and be damaged or the camcorder may not operate correctly. To prevent possible damage under these circumstances, the camcorder is furnished with moisture sensors. However, take the following precautions.

Inside the Camcorder

If there is moisture inside the camcorder, the beep sounds and the ⧈ indicator or the DEW lamp flashes. If this happens, none of the function except cassette ejection will work. Open the cassette compartment, turn off the camcorder, and leave it about 1 hour. When ⏏ indicator flashes at the same time, the cassette is inserted in the camcorder. Eject the cassette, turn off the camcorder, and leave also the cassette about 1 hour.



On the Lens

No indicator will appear, but the picture becomes dim. Turn off the power and do not use the camcorder for about 1 hour.

How to Prevent Moisture Condensation

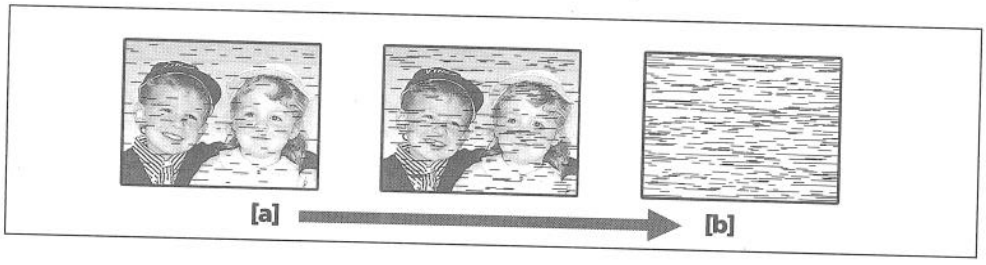
When bringing the camcorder from a cold place to a warm place, put the camcorder in a plastic bag and allow it to adapt to room conditions over a period of time.

(1) Be sure to tightly seal the plastic bag containing the camcorder.

(2) Remove the bag when the air temperature inside it has reached the temperature surrounding it (after about 1 hour).

Video Head Cleaning

To ensure clear pictures, clean the video heads. When ⊗ appears in the viewfinder in CAMERA mode or playback pictures are "noisy" or hardly visible, the video heads may be contaminated.



[a] Slight contamination
[b] Critical contamination
If this happens, clean the video heads with the Sony V8-25CLH cleaning cassette (not supplied). After checking the picture, if it is still "noisy", repeat the cleaning. (Do not repeat cleaning more than 5 times.)

Caution
Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

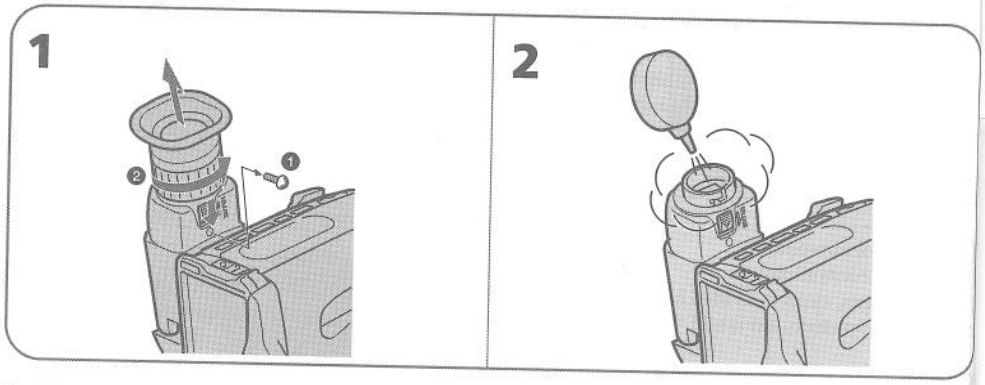
Note
If the V8-25CLH cleaning cassette is not available in your area, consult your nearest Sony dealer.

Removing Dust from inside the Viewfinder

— CCD-TR44/TR54/TR64/TR84 only

(1) Remove the screw with a screwdriver (not supplied). Then, while sliding the RELEASE knob, turn the eyecup in the direction of the arrow and pull it out.

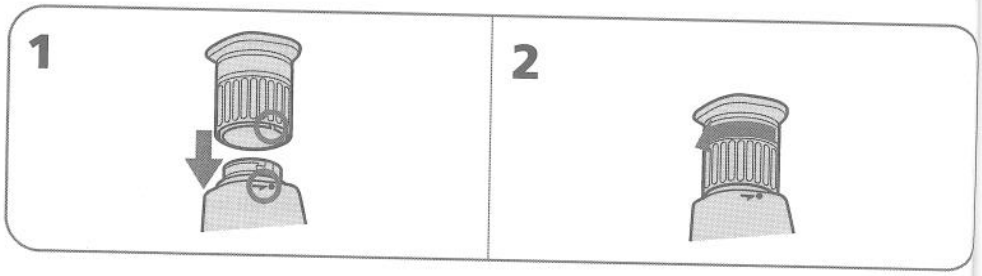
(2) Clean the surface with a commercially available blower.



To Reattach the Eyecup

(1) Align the groove on th eyecup with the • mark on the barrel.

(2) Turn the eyecup in the direction of the arrow. Then, replace the screw.



Caution

Do not remove any other screws. You may remove only the screw to remove the eyecup.

Precautions

Camcorder Operation

- Operate the camcorder using 6.0 V (battery pack), or 7.5 V (AC power adaptor).
- For DC or AC operation, use only the recommended accessories.
- Should any solid object or liquid fall into the casing, unplug the camcorder and have it checked by your nearest Sony dealer before operating it any further.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the POWER switch set to OFF when not using the camera.
- Do not wrap up the camcorder and operate it since heat may build up internally.
- Keep the camcorder away from strong magnetic fields or mechanical vibration.

On Handling Tapes

Do not insert anything into the small holes on the rear of the cassette. These holes are used to sense the type, thickness of tape, or if the tab is out or in.

Camcorder Care

- When the camcorder is not to be used for a long time, disconnect the power source and remove the cassette. Periodically turn on the power, operate the camera and player sections and play back a tape for about 3 minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on the lens, remove them with a soft cloth.
- Clean the camcorder body with a soft dry cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

AC Power Adaptor

Charging

- Use only for the specified battery pack. This unit cannot be used to charge a lithium ion type battery.
- Attach the battery pack firmly.
- Charge the battery pack on a flat surface without vibration.

Others

- Unplug the unit from the wall (mains) outlet when not in use for a long time. To disconnect the cord (mains lead), pull it out by the plug. Never pull the cord itself.
- Do not operate the unit with a damaged cord or if the unit has been dropped or damaged.
- Do not bend the AC power cord (mains lead) forcibly, or put a heavy object on it. This will damage the cord and may cause a fire or an electrical shock.
- Be sure that nothing metallic comes into contact with the metal parts of the connecting plate. If this happens, a short may occur and the unit may be damaged.
- Always keep the metal contacts clean.
- Do not disassemble the unit.
- Do not apply mechanical shock or drop the unit.
- While the unit is in use, particularly during charging, keep it away from AM receivers and video equipment because it will disturb AM reception and video operation.
- The unit becomes warm while in use. This is normal.
- Do not place the unit in locations that are:
  - Extremely hot or cold
  - Dusty or dirty
  - Very humid
  - Vibrating

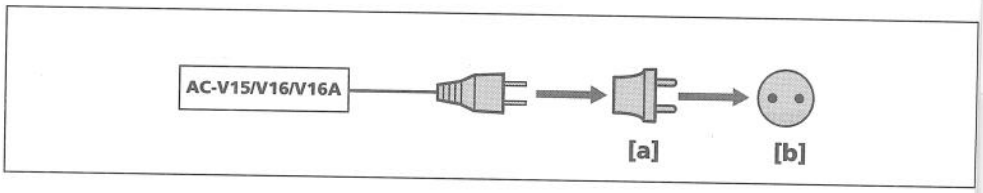
If any difficulty should arise, unplug the unit and contact your nearest Sony dealer.

Using Your Camcorder Abroad

Each country has its own electricity and TV color systems. Before using your camcorder abroad, check the following points:

Power Sources

You can use your camcorder in any country with the supplied AC power adaptor within 110 V to 240 V AC, 50/60 Hz. Use a commercially available AC plug adaptor **[a]**, if necessary, depending on the design of the wall outlet **[b]**.



Difference in Color Systems

This camcorder is an NTSC system-based camcorder. If you want to view the playback picture on a TV, it must be an NTSC system based TV. When you want to use a PAL M system based TV, you will need an NTSC/PAL M transcoder. Check the following alphabetical list.

NTSC system countries
Bahama Islands, Bolivia, Canada, Central America, Chile, Colombia, Ecuador, Jamaica, Japan, Korea, Mexico, Peru, Surinam, Taiwan, the Philippines, the U.S.A., Venezuela, etc.

PAL system countries
Australia, Austria, Belgium, China, Denmark, Finland, Germany, Great Britain, Holland, Hong Kong, Italy, Kuwait, Malaysia, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, etc.

PAL M system country
Brazil

PAL N system countries
Argentina, Paraguay, Uruguay

SECAM system countries
Bulgaria, Czech Republic, France, Guyana, Hungary, Iran, Iraq, Monaco, Poland, Russia, Slovak Republic, Ukraine, etc.

Trouble Check

If you run into any problem using the camcorder, use the following table to troubleshoot the problem.

Camcorder

	Symptom	Cause	Corrective Actions	page
Power	The power is not on.	The battery pack is not attached or not attached firmly.	Attach the battery pack firmly by pushing the lower part of the battery pack.	10
		The battery is dead.	Use a charged battery pack.	7
		The AC power adaptor is not connected to a wall outlet.	Connect the AC power adaptor to a wall outlet.	21
	The power goes off.	While being operated in CAMERA mode, the camcorder has been in the Standby mode for more than 5 minutes.	Turn STANDBY down once and turn it up again.	13
		The battery is dead.	Use a charged battery pack.	7
	The battery pack is quickly discharged.	The ambient temperature is too low.	—	34
		The battery pack has not been charged fully.	Charge the battery pack again.	7
		The battery pack is completely dead, and cannot be recharged.	Use another battery pack.	35
Operation	START/STOP does not operate.	The tape is stuck to the drum.	Eject the cassette.	11
		The tape has run out.	Rewind the tape or use a new one.	19
		The POWER switch is set to PLAYER.	Set to CAMERA.	12
		The tab on the cassette is out (red).	Use a new cassette or slide the tab.	11
	The cassette cannot be removed from the holder.	The battery is dead.	Use a charged battery pack or the AC power adaptor.	7, 21
	No function except for cassette ejection works.	Moisture condensation has occurred.	Remove the cassette and leave the camcorder for at least an hour.	38
	The tape does not move when a tape transport button is pressed.	The POWER switch is set to CAMERA or OFF.	Set it to PLAYER.	19
		The tape has run out.	Rewind the tape or use a new one.	19
	The date or time indicator is flashing.	You pressed DATE and TIME together for more than 2 seconds.	The camcorder is not malfunctioning. You may start recording. Flashing will stop soon.	—
	The date or time indicator disappears.	—	Reset the date and time.	33

(to be continued)

Trouble Check

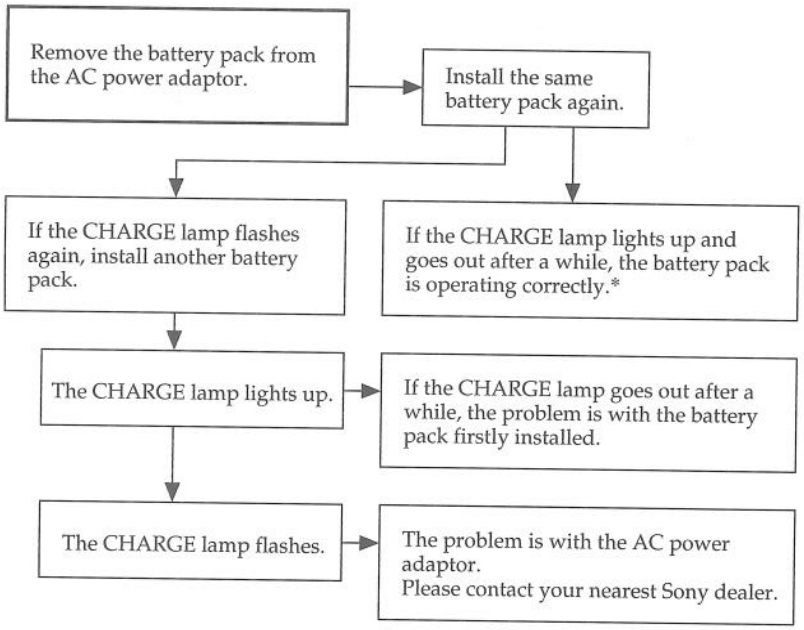
	Symptom	Cause	Corrective Actions	page
Picture	The image on the viewfinder screen is not clear.	The viewfinder lens is not adjusted.	Adjust the viewfinder lens.	13
	A vertical band appears when a subject such as lights or a candle flame is shot against a dark background.	The contrast between the subject and background is too high.	The camcorder is not malfunctioning. Change locations.	—
	The picture is "noisy".	The video heads may be dirty.	Clean the heads using the Sony V8-25CLH cleaning cassette.	39
Others	The supplied Remote Commander does not work. (For CCD-TR54/TR64/TR74/TR84/TR94 only)	COMMANDER is set to OFF.	Set it to ON.	29
		Something is blocking the infrared rays.	Remove the obstacle.	—
		The battery is not inserted with the correct polarity.	Insert the battery with the correct polarity.	52
		The batteries are dead.	Insert new ones.	52
	There is dust in the viewfinder. (For CCD-TR44/TR54/TR64/TR84 only)	—	Detach the eyecup and clean the viewfinder lens.	40

AC Power Adaptor

	Symptom	Cause	Corrective Actions	page
AC power adaptor	The POWER lamp does not light.	—	Set the selector to VTR (DC OUT) and disconnect the AC power cord. After about one minute, try again.	9
	The CHARGE lamp flashes.	See the following chart.		

When the CHARGE Lamp Flashes

Check through the following chart.


Remove the battery pack from the AC power adaptor.
Install the same battery pack again.
If the CHARGE lamp flashes again, install another battery pack.
If the CHARGE lamp lights up and goes out after a while, the battery pack is operating correctly.*
The CHARGE lamp lights up.
If the CHARGE lamp goes out after a while, the problem is with the battery pack firstly installed.
The CHARGE lamp flashes.
The problem is with the AC power adaptor.
Please contact your nearest Sony dealer.

* If you use a battery pack which you have just bought or which has been left unused for a long time, the CHARGE lamp may flash at the first charging. But this is not a problem. Repeat again to charge with the same battery pack.

Specifications

Video Camera Recorder

System

Video recording system
Two rotary heads, Helical scanning, FM system

Audio recording system
Rotary heads, FM system

Video signal
NTSC color, EIA standards

Usable cassette
8 mm video format cassette (standard 8 mm)

Recording/Playback time
SP mode: 2 hours (P6-120)
LP mode: 4 hours (P6-120)

Fastforward/rewind time
Approx. 5 min. (P6-120)

Image device
CCD (Charge Coupled Device)

Viewfinder
Electronic viewfinder,
CCD-TR44/TR54/TR84: Black and white
CCD-TR64/TR74/TR94: Color

Lens
CCD-TR44: 10 x, Combined power zoom lens, F1.6 – 2.7
CCD-TR54/TR64: 12 x, Combined power zoom lens, F1.8 – 2.7
CCD-TR74/TR84/TR94: 12 x (optical), 24 x (digital), Combined power zoom lens, F1.8 – 2.7

Focal distance
CCD-TR44: f = 1/4 – 2 1/2 inches (6.3 – 63 mm)
CCD-TR54/TR64/TR74/TR84/TR94: 7/32 – 2 5/8 inches (5.4 – 64.8 mm) When converted to a 35 mm still camera
CCD-TR44: 1 13/16 – 17 3/4 inches (45 – 450 mm)
CCD-TR54/TR64/TR74: 1 9/16 – 18 1/2 inches (39 – 468 mm)
CCD-TR84/TR94: 1 7/8 – 22 1/4 inches (47 – 564 mm)

Color temperature
Auto

Minimum illumination
CCD-TR44: 0.6 lx at F 1.6
CCD-TR54/TR64/TR74: 0.8 lx at F 1.8
CCD-TR84/TR94: 3.0 lx at F 1.8

Illumination range
CCD-TR44: 0.6 to 100,000 lx
CCD-TR54/TR64/TR74: 0.8 to 100,000 lx
CCD-TR84/TR94: 3.0 to 100,000 lx

Recommended illumination
More than 100 lx

Input and Output connectors

Video output
Phono jack, 1 Vp-p, 75 Ω, unbalanced

Audio output
Monaural, Phono jack, 327 mV, (at load impedance 47 kΩ), impedance less than 2.2 kΩ

RFU DC OUT
Special minijack, DC 5 V

LANC jack
Stereo-mini-mini-jack (ø 2.5 mm)

MIC jack
Mini-jack, 0.388 mV, low impedance with 2.5 to 3 V DC, output impedance 6.8 kΩ (ø 3.5 mm)

General

Power requirements
On battery mounting surface 6.0 V (battery pack), 7.5 V (AC power adaptor)

Average power consumption
CCD-TR44/TR54: 3.6 W
CCD-TR64: 3.7 W
CCD-TR74: 3.9 W
CCD-TR84: 4.0 W
CCD-TR94: 4.1 W

Operating temperature
32°F to 104°F (0°C to 40°C)

Storage temperature
–4°F to +140°F (–20°C to +60°C)

Dimensions
Approx. 4 3/8 x 4 1/8 x 8 inches (110 x 103 x 202 mm) (w/h/d)

Mass
Excluding the battery pack, lithium battery, cassette and shoulder strap
CCD-TR44/TR54/TR64: Approx. 1 lb 8 oz (690 g)
CCD-TR74/TR84/TR94: Approx. 1 lb 8 oz (700 g)
Including the battery pack NP-33, lithium battery CR2025, cassette P6-120 and shoulder strap
CCD-TR44/TR54/TR64: Approx. 2 lb (910 g)
CCD-TR74/TR84/TR94: Approx. 2 lb (920 g)

Microphone
Electret condenser microphone, monaural type

Supplied accessories
See page 5.

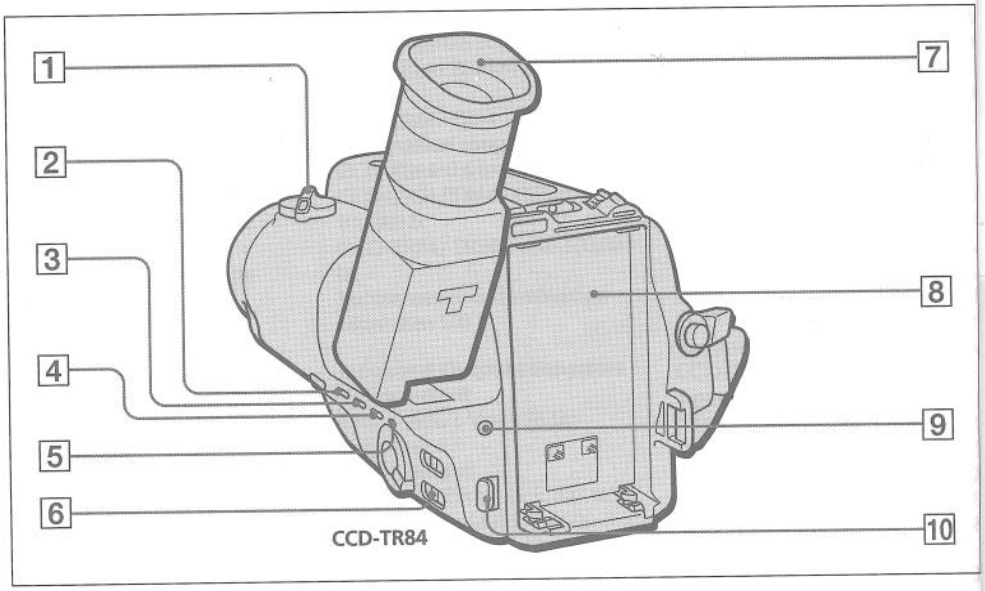
AC power adaptor

Power requirements
110 – 240 V AC*, 50/60Hz
Power consumption
AC-V15: 18 W
AC-V16: 20 W
AC-V16A: 22 W
Output voltage
DC OUT in operation mode
AC-V15: 7.5 V, 1.6 A
AC-V16/V16A: 7.5 V, 1.8 A
Battery charge terminal
10 V, 1.1 A in charge mode
Application
Sony battery packs NP-33 (supplied), NP-60D, NP-C65, NP-66H, NP-68, NP-80/80D, NP-98/98D
Operating temperature
32°F to 104°F (0°C to 40°C)
Storage temperature
–4°F to +140°F (–20°C to +60°C)
Dimensions
Approx. $6\ ^{5}/_{8} \times 1\ ^{11}/_{16} \times 3$ inches (166 x 43 x 75 mm) (w/h/d) including projecting parts and controls
Mass
AC-V15/V16: Approx. 15 oz (420 g)
AC-V16A: Approx. 16 oz (450 g)

* Canadian Standard Association (CSA) certifies 120 V AC only.

Design and specifications are subject to change without notice.

Identifying the Parts



1 **POWER switch (p. 12, 19)**

2 **DATE(+) button (p. 23, 33)**

3 **TIME(NEXT) button (p. 23, 33)**

4 **TITLE button (p. 27)**

5 **COUNTER RESET button (p. 14)**

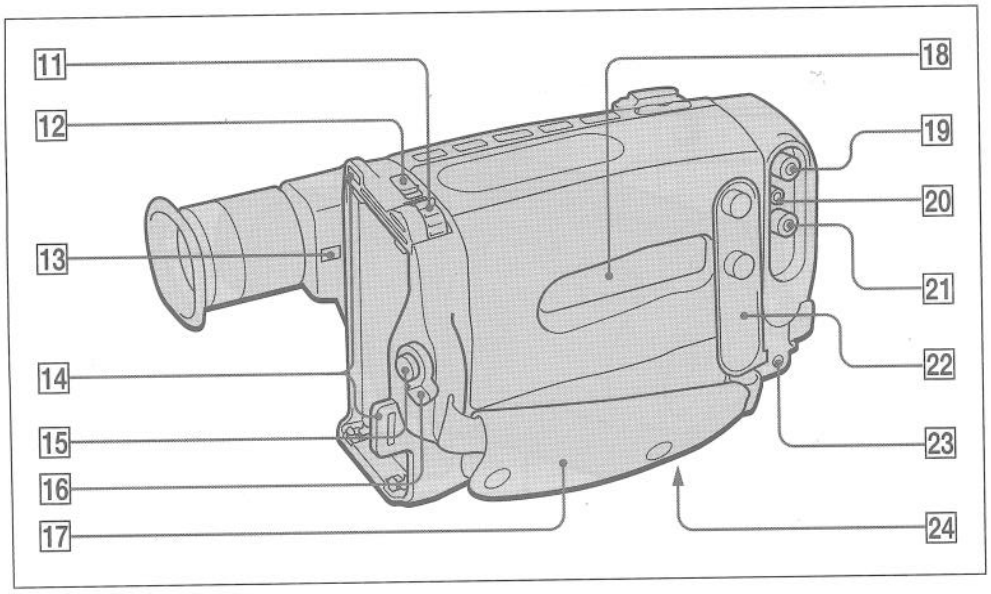
6 **STEADY SHOT mode switch (p. 28)**
For CCD-TR84/TR94 only

7 **Eyecup (p. 16)**

8 **Battery mounting surface (p. 10)**

9 **LANC control jack**
Connect the LANC connecting cable to a wired remote control unit such as an editing controller. In this case, set the COMMANDER mode to OFF (p. 29). stands for Local Application Control Bus sytem. The control jack is used for controlling the tape transport of video equipment and peripherals connected to it. This jack has the same function as the connectors indicated as CONTROL L or REMOTE.

10 **BATT (battery) release knob (p. 10)**



11 **Power zoom lever (p. 15)**

12 **EJECT knob (p. 11)**

13 **Eyecup release knob (p. 40)**
For CCD-TR44/TR54/TR64/TR84 only

14 **Hooks for shoulder strap (p. 51)**

15 **START/STOP button (p. 12)**

16 **STANDBY switch (p. 12)**

17 **Grip strap (p. 16)**

18 **Cassette compartment (p. 11)**

19 **VIDEO OUT jack (p. 18)**

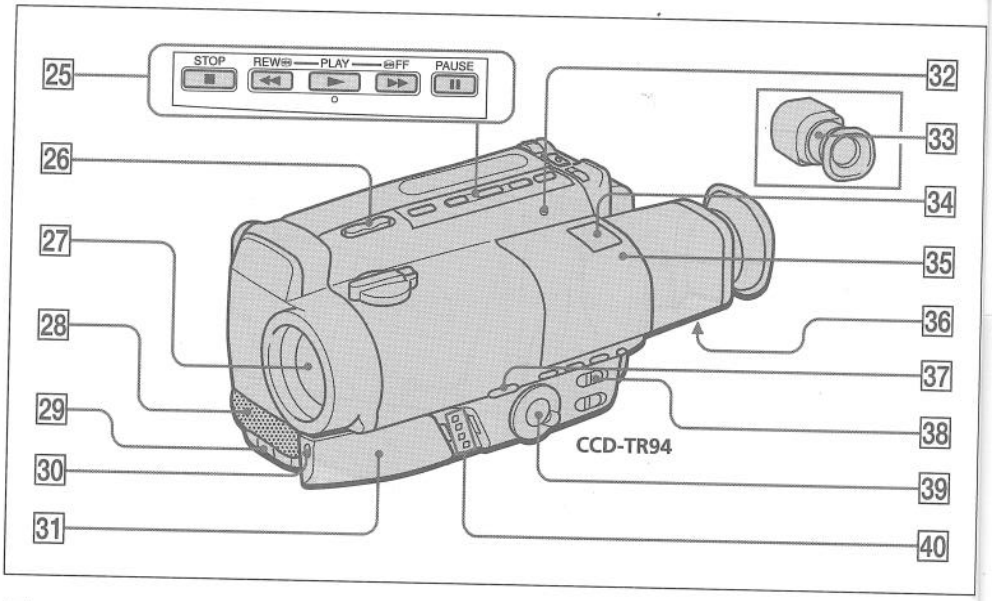
20 **RFU DC OUT (RFU adaptor DC out) jack**

21 **AUDIO OUT jack (p. 18)**

22 **Jack cover**

23 **MIC (microphone) jack**
Connect an optional external microphone. This jack also accepts a "plug-in-power" microphone.

24 **Tripod receptacle (p. 16)**
Attach a tripod (not supplied) here.



25 **Tape transport buttons (p. 19, 20)**
■ STOP
◄◄ REW (rewind)
► PLAY (playback)
►► FF (fast forward)
❚❚ PAUSE
These buttons will function in PLAYER mode.

26 **EDITSEARCH button (p. 17)**

27 **Lens cover**

28 **Built-in microphone**

29 **Remote sensor (p. 53)**

30 **Camera recording/battery lamp**

31 **Lithium battery compartment (p. 32)**

32 **DEW lamp (p. 38)**

33 **Viewfinder adjustment ring (p. 13)**
For CCD-TR44/TR54/TR64/TR84 only

34 **Lighting aperture**
For CCD-TR74/TR94 only

35 **Viewfinder (p. 13, 54)**

36 **Viewfinder adjustment lever (p. 13)**
For CCD-TR74/TR94 only

37 **BACK LIGHT button (p. 25)**

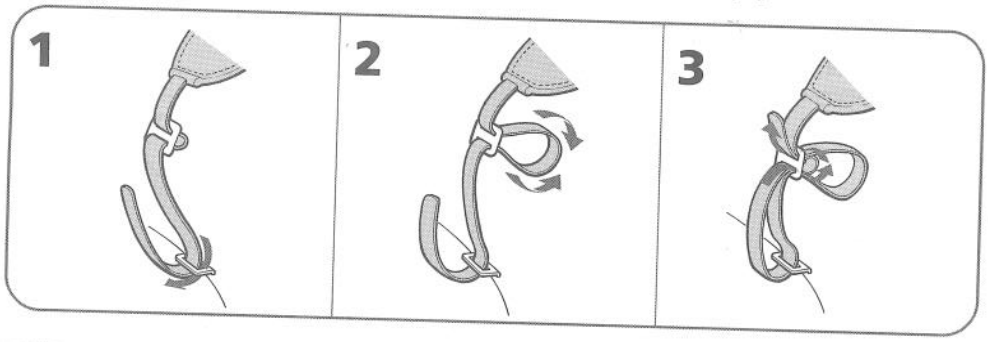
38 **START/STOP MODE switch (p. 12, 13, 26)**

39 **PROGRAM AE dial (p. 24)**

40 **Mode switches (p. 29)**

Attaching the shoulder strap

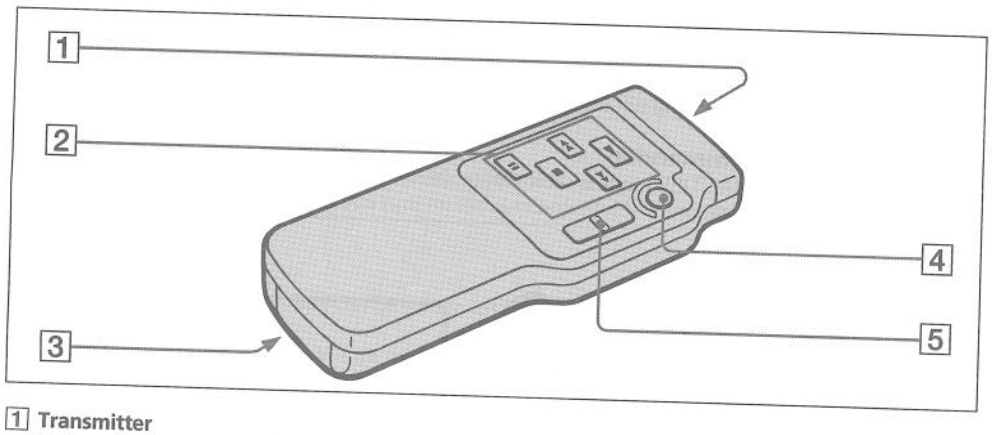
Attach the supplied shoulder strap to the hooks for the shoulder strap (14 on page 49).



Remote Commander

— For CCD-TR54/TR64/TR74/TR84/TR94 only

The buttons that have the same name on the Remote Commander and on the camcorder function identically.



1 Transmitter
Point toward the remote sensor to control the camcorder after turning on the POWER switch on the camcorder.

2 Tape transport buttons (p. 19, 20)

3 Size AA (R6) battery holder (p. 52)

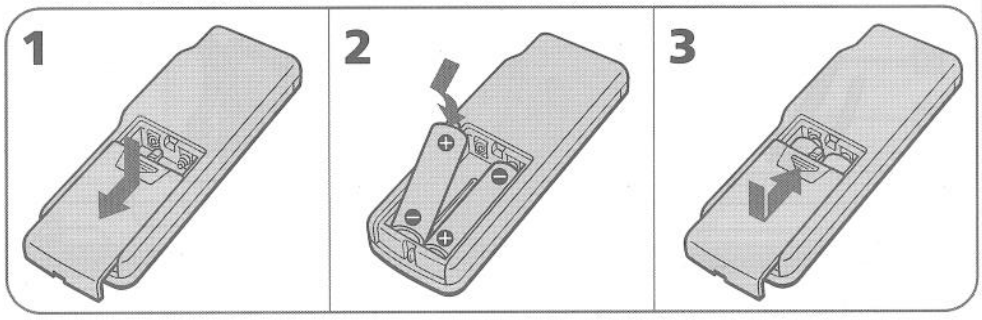
4 START/STOP button

5 Power zoom button
The zooming speed is unchangeable on the Remote Commander.

Preparing the Remote Commander

To use the Remote Commander, you must insert two size AA (R6) batteries. Use the supplied size AA (R6) batteries.

(1) Remove the battery cover from the Remote Commander.
(2) Insert both of the size AA (R6) batteries with correct polarity.
(3) Put the battery cover back onto the Remote Commander.



Note on battery life

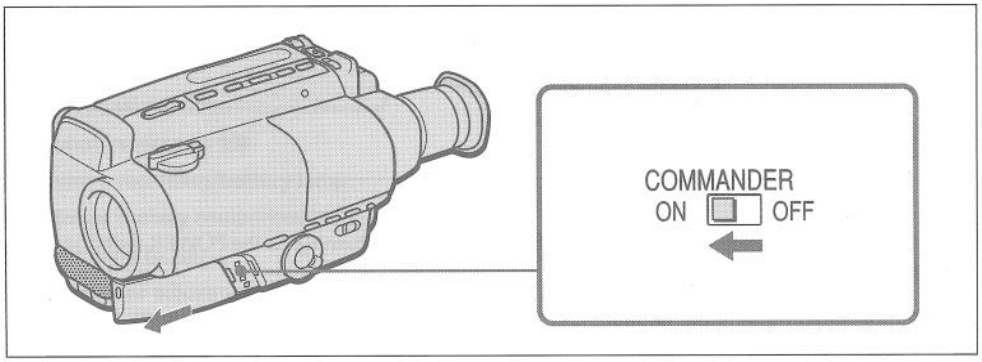
The batteries for the Remote Commander last about 6 months under normal operation. When the batteries become weak or dead, the Remote Commander does not work.

To avoid damage from possible battery leakage

Remove the batteries when you will not use the Remote Commander for a long time.

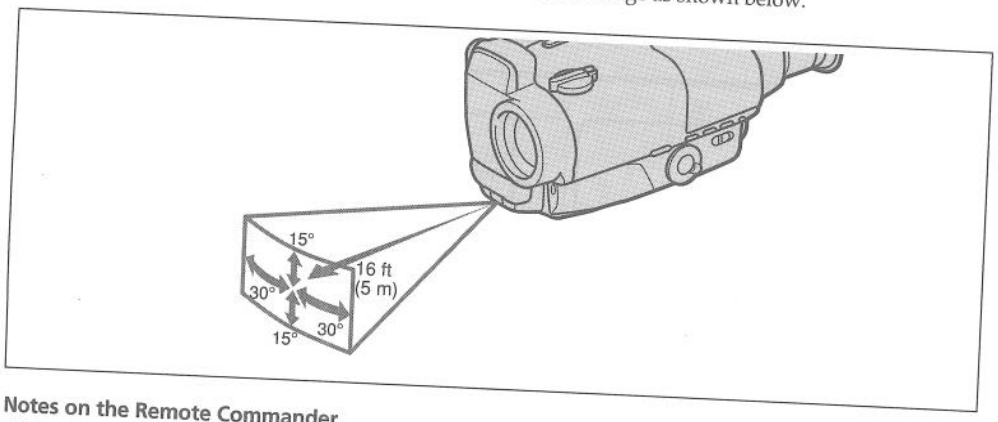
Using the Remote Commander

Make sure that the COMMANDER mode is set to ON (p. 29).



Remote Control Direction

Aim the Remote Commander to the remote sensor within the range as shown below.



Notes on the Remote Commander

- Keep the remote sensor away from strong light sources such as direct sunlight or illumination. Otherwise, the remote control may not be effective.
- Be sure that there is no obstacle between the remote sensor and the Remote Commander.
- This camcorder works at commander mode VTR 2. The commander modes (1, 2, and 3) are used to distinguish this camcorder from other Sony VCRs to avoid remote control misoperation. If you use another Sony VCR at commander mode VTR 2, we recommend you change the commander mode or cover the remote sensor of the VCR with black paper.

To Watch the Demonstration

You can watch a brief demonstration of pictures with titles.
If the demonstration appears when you turn on the camcorder for the first time, exit the Demo mode to use your camcorder.

To enter Demo mode

(1) Eject the cassette and turn the POWER switch to OFF.
(2) Turn STANDBY up.
(3) While holding down ► PLAY, turn the POWER switch to CAMERA. Demonstration starts. The demonstration stops when you insert the cassette.

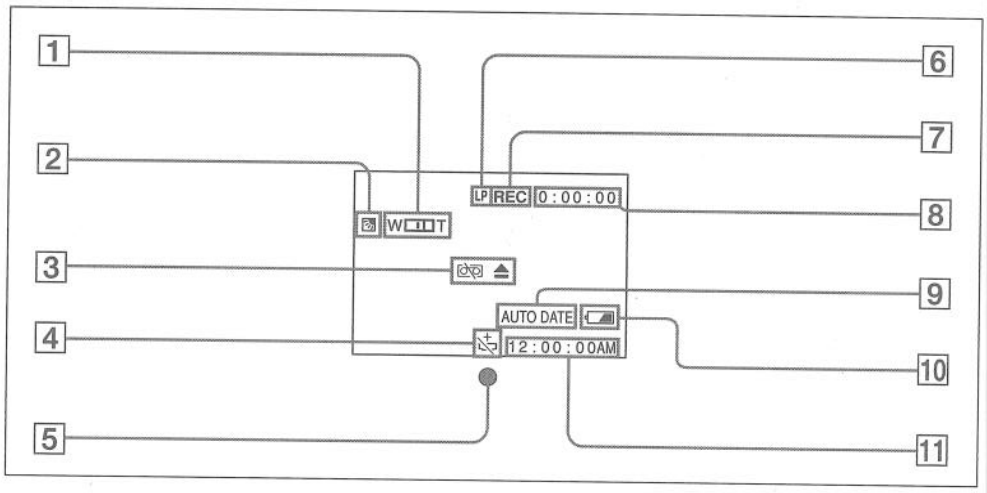
Note that once you enter Demo mode, this mode is retained as long as the lithium battery is in place. Therefore, demonstration starts automatically 10 minutes later every time you turn the POWER switch to CAMERA, or after you eject the cassette.

To exit Demo mode

(1) Turn the POWER switch to OFF.
(2) Turn STANDBY up.
(3) While holding down ■ STOP, turn the POWER switch to CAMERA.

In the Viewfinder

The indicators appear in CAMERA mode only.



1 **Power zoom indicator (p. 15)**
For CCD-TR74/TR84/TR94 only

2 **Backlight indicator (p. 25)**

3 **Warning indicator (p. 55)**

4 **Lithium battery indicator (p. 31)**

5 **Recording lamp/battery lamp (p. 12)**

6 **Recording in LP mode (p. 12)**

7 **Tape transport mode (p. 12)**

8 **Tape counter (p. 14)**

9 **AUTO DATE indicator (p. 12)**

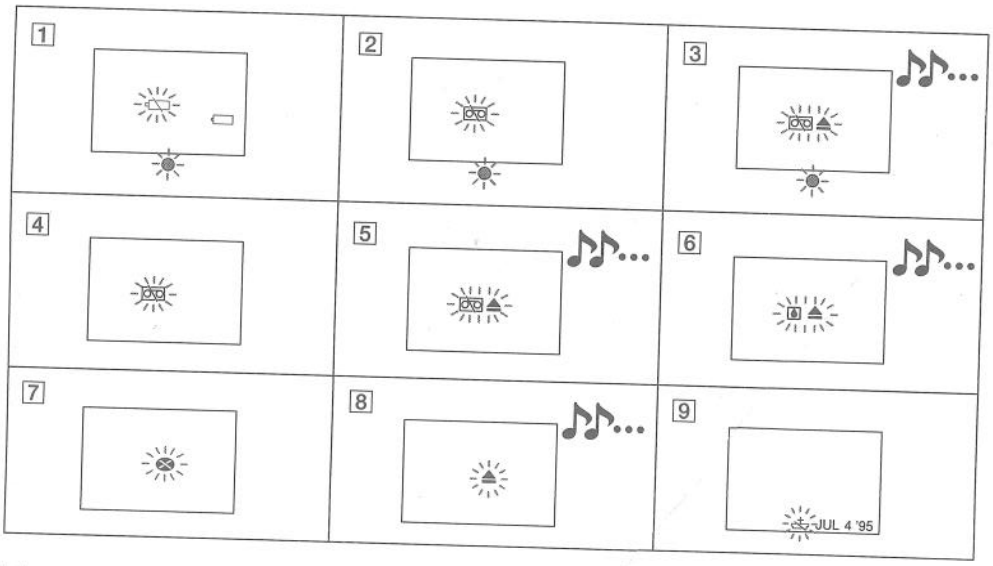
10 **Remaining battery indicator (p. 34)**

11 **Date, Time or Title (p. 23, 27)**

Warning Indicators

All indicators appear only when you use the camcorder in CAMERA mode.
If indicators flash in the viewfinder, or a caution lamp on the camcorder flashes, check the following:

♪: You can hear the beep sound when BEEP is set to ON (p. 29).



1 Battery Remaining
Slow flashing: The battery is weak.
Fast flashing: The battery is dead.

2 The tape is near the end.

3 The tape has run out.

4 No tape has been inserted.

5 The tab on the tape is out (red) (p. 11).

6 Moisture condensation has occurred (p. 38).
⏏ indicator appears only when the cassette is inserted.

7 The video heads may be contaminated (p. 39).

8 Some other trouble has occurred.
Disconnect the power source and contact your Sony dealer or local authorized facility.

9 The lithium battery is weak or the lithium battery is not installed (p. 31).
This indicator flashes just only after powering on.

Index

A

AC power adaptor 7, 21
Adjusting viewfinder 13
AUTO DATE 12
A/V connecting cable 18

B

BACK LIGHT 25
Battery 52
Battery case 22
Battery lamp 35, 55
Battery pack 7
BEEP 14, 29

C

Camera recording 12
Car battery 23
Charging battery 7
Cleaning video heads 39
Connection 18
COUNTER RESET 14

D

DATE/TIME 23
DEMO mode 53
Digital zoom 15

E

Editing 30
EDITSEARCH 17
EJECT 11

F, G, H

Fast-forward 19
5 sec. recording 26
High-speed shutter mode 24

I, J, K, L

LANC 48
Lithium battery 31

M, N, O, P

MIC (microphone) jack 49
Playback on TV 19
Playback pause 20
Power sources 21
Power zoom 15
PROGRAM AE 24

Q, R

REC MODE 29
Rec. Review 17
Remote Commander 51
Rewind 19

S

Shoulder strap 51
Sports mode 24
STANDBY 12
Standby mode 13
STEADY SHOT 28
Supplied accessories 5

T, U, V, W, X, Y

Tape counter 14
Title 27
Tripod mounting 16
Trouble check 43
Twilight mode 24

Z

Zoom 15

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